MANNING'S ILLUSTRATED HORSE BOOK

JOHN A. SEAVERNS

MANNING'S

HORSE BOOK

COMPRISING

FACTS CONCERNING THE VARIOUS BREEDS AND THEIR CHARACTERISTICS, BREAKING, TRAINING, SHELTERING, BUYING, SELLING, GENERAL CARE, AND ALL DISEASES TO WHICH THEY ARE SUBJECT—THE CAUSES, HOW TO KNOW, AND WHAT TO DO; GIVEN IN PLAIN, SIMPLE LANGUAGE, AND WITH DIRECTIONS THAT ARE EASILY UNDERSTOOD, EASILY APPLIED, AND REMEDIES THAT ARE WITHIN REACH OF THE PEOPLE. ALSO, THE RECENT, APPROVED, HUMANE METHODS FOR THE PREVENTION OF ANY DISEASE, AND RESTORATION OF HEALTH.

CAREFULLY PREPARED, AFTER A RIPE EXPERIENCE OF TWENTY-FIVE YEARS IN STOCK-RAISING AND AN EXTENSIVE PRACTICE IN VETERINARY SURGERY,

BY

J. RUSSELL MANNING, M. D., V. S.

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THE HORSE;

—:HIS:—

HISTORY, BREEDS, CHARACTERISTICS AND MANAGEMENT.

THE HORSE.

CHAPTER I.

HIS HISTORY AS A COMPANION AND SERVANT OF MAN.

CONNECTED WITH MAN FROM A VERY EARLY AGE.——HIS IMPORTANCE AS A HELPER IN THE WORK OF THE WORLD.——HIS SUPERIORITY OVER THE OTHER ANIMALS.——THE HORSE AND HIS RIDER BECOME IN SOME MEASURE ONE CREATURE.——HIS NATIVITY: DOUBT CONCERNING IT.——HIS EXISTENCE UPON EARTH PROBABLY CONTEMPORANEOUS WITH THAT OF MAN.——THE MOST ANCIENT AUTHORS ALLUDE TO HIM.——HE PASSES INTO DIFFERENT PARTS OF THE GLOBE.——WILD HERDS IN THE EASTERN CONTINENT.——ORIGIN OF THE WILD HERDS IN AMERICA.——FOUND AS A DOMESTIC AMONG NEARLY ALL PEOPLE.——GREATER LIABILITY TO DISEASE IN A DOMESTIC THAN IN A WILD STATE.——SUBJECT TO DETERIORATION UNDER IGNORANT MANAGEMENT.——THE WISDOM OF THE ARABS AS BREEDERS AND KEEPERS.——DIFFERENCE OF OPINION AMONG MEN AS TO SYSTEMS OF BREEDING: ATTENTION CALLED TO ITS TREATMENT IN THIS WORK.——KNOWLEDGE AND SKILL NECESSARY TO HIS PROPER CARE.

"And God made the beast of the earth after his kind, and cattle after their kind, and everything that creepeth upon the earth after his kind: and God saw that it was good. And God said, Let us make man in our image, after our likeness; and let them have dominion over the fish of the sea, and over the fowl of the air, and over the cattle, and over all the earth."

Although the precise period at which the horse was subjected to the use of man is unknown, it is not unreasonable to conjecture that it was at a time long anterior to his mention in history; and it is probable that since the day when man was made master of all other created things, no animal has been more constantly his companion and friend; and that no other has contributed so much assistance in subduing wild nature and making everything subservient to his will and promotive of his happiness. Other animals, particularly sheep and cattle, have shared with the horse this usefulness to mankind, it is true; and in our present civilized state, when mechanical ingenuity is making such rapid strides in dispensing with

animal labor, it may be, as is sometimes claimed, that the wool-bearing and milk-giving animals—especially considering that these same animals furnish also a large proportion of our flesh food—are to be held as taking the precedence; but as to adaptability, becoming, as it were, a creature of all work; as to comeliness and quickness of motion; as to a certain sympathy with his master that makes him at times so to partake of his spirit and motions as to seem one with him; as to a readiness of submission to drudgery as well as to proud employments, he is without a rival in the world.

It is affirmed by many that the horse is a native of Asia, but of this we really know nothing. Others affirm with equal, or almost equal, plausibility, that he is a native of central Africa. Where all is conjecture, it is needless in a practical work of this character to speculate. Wherever his primal home may have been, it is at least within the bounds of probability that his existence in Asia, in his present state of development, is contemporary with that of man upon earth. Some among the very earliest records of the human race contain allusions to him as a well known animal, in the service of man. The description in the Book of Job, a production admitted to be of the very highest antiquity, is a case in point. He is mentioned here, in glowing terms, as a martial adjunct to his master—and not as a newly-discovered or recently-subdued creature, but as one with which the world was familiar. Sculptured images of horses as beautiful of form almost as the noble Arabian of to-day have been found among the ruins of the cities of the desert. He is mentioned by Moses in connection with the Egyptians; and records older than the writings of Moses point to his having been known and used by that singular people from the dawn of their wonderful civilization.

We find him thus in both Asia and Africa; and during all the historic period he has been present with man as though native to the soil of many districts of both Continents. Whether borne thither by natural result of migratory wandering, in a wild state, or whether by the ever-spreading human family, there is little to guide us in determining. In the more thinly populated districts of Asia, notably in Southern Siberia, great wild herds have been long known to exist.

Though, as we have previously intimated, there must have been a noble breed of horses in Arabia in the days of their most ancient cities, the introduction of the present breed into that country is thought to have been of a comparatively modern date. It seems clear that long subsequent to the beginning of the Christian era there were few horses in Arabia, and those few of no striking excellence, and that the now celebrated Arabians have either sprung from good horses introduced into the

country within the last thousand years, or are the result of judicious breeding and kindly care bestowed upon a native stock.

He was brought as a domestic animal to the New World, by the early adventurers;—and no trace of him, (if we except a kind of cloven-footed species), having been found upon the Continent, we can account for the herds of wild horses, known to have long existed in different parts of North and South America, upon no other supposition than that they are the descendants of certain Andalusian mares and steeds brought over by the Spaniards, and abandoned by them when they could no longer render them service, or left free to escape to the forests on the death of their masters in battle. There is a story current—of doubtful authenticity, however—that all these immense herds, in both North and South America, are sprung from one stallion and two mares that escaped from the expedition of De Soto through Florida, Georgia, and elsewhere. Be this as it may, there are now many great herds—a single one, especially in South America, sometimes numbering many thousands.

As a domestic animal, the horse is found among almost every people on the globe; and his uses vary with the degree of civilization enjoyed by his owners. It may be remarked also that this degree of usefulness is intimately associated with the degree of his deterioration and with the diseases to which he is subject. In a wild state, he is almost free from disorders of every kind,—so much so that unless killed by accident or by deprivation of necessary food and drink, as is sometimes the case, he lives to a great age—dying in the course of nature, it is believed, at from thirty to sixty years. Among the Arabs, where his condition approaches more nearly to a natural state than among any other people, except the Indians, and where his laborious service to his master is limited almost exclusively to carrying a single rider, he displays his greatest perfections as a domestic animal, and enjoys the greatest immunity from disease. Among the leading nations of Europe and their colonies, where he is for the most part made literally "a beast of burden" in the different capacities of animal for the saddle and for every species of draught, and where man practices almost unrestrained not only his active cruelties but many unwitting enormities, he is said by good authority to be constantly deteriorating and becoming more and more subject to diseases and to premature death.

Among the Arabs, too, the best breeds are preserved in their purity; whereas, among more civilized nations all efforts of man to improve the stock, or even to preserve any desired quality, result at last in rendering the subjects of his experiments more liable to fall into various disorders, and, except in rare instances, in ultimate failure.

It may not be irrelevant to state in this connection that the great excellence of the Arabian of the present day, whatever may have been his origin, is due in part to the extraordinary affection felt for him by his master, which manifests itself in the extreme care that is lavished upon him, and to which he is almost as sensitive as a human creature; in part to his freedom from that severe labor by which the horses of other nations are prematurely broken, stiffened, and deprived of spirit; and partly, no doubt, by the steps which are taken, not so much to *improve*, but to *preserve*, a choice breed. While other nations, notably the English, French and American, are engaged in ceaseless endeavors to improve, and, according to some authorities, constantly making lamentable failures—defeating their own ends by the systems of breeding, training, and use, which they adopt—the wild sons of the desert maintain for their horses from age to age the superiority which they were first found to possess.

Men differ in opinion as to the cause of all this, and the mooted questions of crossing and in-and-in breeding find their respective champions, and the discussion is from time to time renewed; but the fact remains that the horses of Arabia excel all others; while another important fact seems to be most generally overlooked, that the Arabs neither cross nor actually breed in-and-in, but, having by some means obtained a noble race they guard equally against admitting admixture of blood and against too close consanguinity.

The subject of breeding, however, will be found to have been more fully discussed under its proper head; and in conclusion it will perhaps be sufficient to urge upon the attention of the intelligent owner and breeder some few facts which have been touched upon in the course of this brief sketch, namely: That among horses in a wild state disease is rarely known, though admixture of blood most probably does take place, and, for aught we know to the contrary, as close in-and-in breeding as the most pronounced advocate of that system could wish. Thus, we find exemption from destructive disorders, but ordinarily no strongly marked characteristics of race constantly prevailing, and but rarely among them what may be termed really fine animals.

Again, that among the horses of the Arabs and the American Indians, disease is almost as rare as among the wild herds. And again, among those nations where the horse is in the highest degree useful, becoming more the slave than the companion of man, he is the subject of a multitude of infirmities scarcely equalled in number by those to which man is himself heir. It has been said that in becoming the companion and the servant of man, he has partaken, in some measure, of both man's spirit and his physical frailties. In battle, he adds to the terrors of the conflict

by his fierceness as well as by his strength and swiftness; in the stables of careless opulence, he becomes the pampered victim of abundance, and falls a prey to diseases that come by irregular exercise and surfeiting; with hard and driving task-masters, in the marts of trade, and subject to the exactions of business, he is soon stiffened, spavined, and generally broken as to both conformation and locomotion; while among the poorer class of tillers of the soil and other toilers, he seems to become spiritless and dull, and subject to diseases that come rather from want of care than from either over-work or actual deprivation of food and drink.

In his best estate, he is the noblest of the lower animals; in his worst, he is still a property of man, and a helper in his work. A knowledge of his ailments, and the possession of that skill necessary to his relief, is therefore essential to every one who owns even the commonest of the species.

CHAPTER II.

ILLUSTRATED DESCRIPTION.

NECESSITY FOR A COMPREHENSIVE IDEA OF THE CONSTRUCTION OF THE HORSE, AND THE RELATIONS OF HIS PARTS.——SCIENTIFIC TERMS USED, BUT EXPLAINED.——SUBSEQUENT PORTIONS OF THE WORK MORE READILY UNDERSTOOD BY REFERENCE TO THIS CHAPTER. ——KNOWLEDGE OF STRUCTURE INDISPENSABLE TO SURGERY.——SKELETON; SECTIONAL VIEW OF THORAX, ABDOMEN, AND PELVIS; VERTICAL SECTION OF HEAD; SECTION OF FOOT; FRONT AND BACK VIEW OF FOOT; AND EXTERNAL PARTS.

In order that the reader may obtain a clear and comprehensive knowledge of the construction of the horse in all his parts and of the proper relations of those parts, it is thought best to introduce here, in one connected view, a description of the frame-work or skeleton, as seen in Fig. 1; of the internal organs and their positions, as seen in Fig. 2; of the head and its contents, Fig. 3; of the peculiar formation of the foot, Figs. 4, 5, and 6, and of the external parts of the animal, Fig. 7.

It will be observed that while we have used the ordinary scientific terms in naming these various parts, we have annexed, wherever necessary, such explanations as will enable the plain reader to get the full meaning intended to be conveyed.

Some attention devoted to the subject here will of course supersede the necessity of constantly recurring and tedious explanations throughout the subsequent part of the work. The clearness and fulness of the illustrations provided leave nothing more, we think, to be desired on that head; and if the reader chance to find, in our directions as to the treatment of any disease, allusions to the structure of certain parts which he has not well in mind, or terms used with which he is not entirely familiar, his difficulties can be speedily removed by reference to this chapter.

Any attempt to perform those surgical operations, however simple, which sometimes become necessary in the treatment of domestic animals, must of course be directed by that knowledge of form, structure, and related functions which we endeavor here to impart.

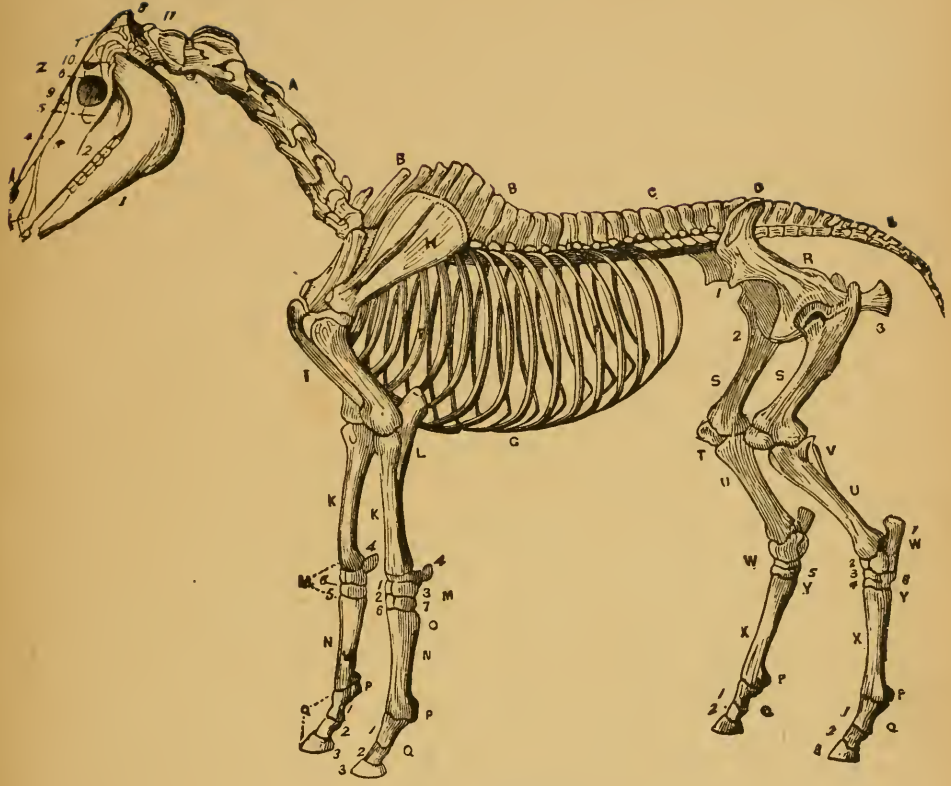


FIG. 1. SKELETON.

Explanations.—**A**—Cervical vertebræ, or seven bones or joints of the neck.

B, B—Dorsal vertebræ, or the eighteen larger joints of the back-bone.

C—Lumbar vertebræ:—the six joints of the back-bone lying between the upper ends of the false ribs, and the upper edge of the haunch bones.

D—Sacrum, or bone which forms the back part of the pelvis.

E—Coccygeal bones, or tail bones.

F, F—Ribs.

G—Costal cartilages, or the cartilages by which the ends of the ribs are joined.

H—The scapula, or shoulder blade.

I—The humerus, or large round bone between the point of the shoulder and the elbow, or upper part of the fore-leg.

K, K—The radiuses, the outer bones of the fore-legs, extending from humerus to knee.

L—The ulna, the larger of the two bones of the upper part of fore-leg, lying behind the radius and extending from the knee to the lower part of chest.

M—The carpus, or knee, composed of: 1, the scaphoid, or bone having a boat-like form; 2, the semi-lunar, or bone resembling a half-moon; 3, the cuneiform, or wedge-shaped bone; 4, the trapezium, or bone resembling the mathematical figure of that name; 5, the trapezoid, or bone resembling a trapezoid; 6, the os magnum, or great bone of the knee; 7, the unciform, or hook-shaped bone; 8, the pisiform, or pea-shaped bone.

N, N—The large metacarpal or cannon, the big bone of the fore-leg reaching from the knee to the ankle.

O—Small metacarpal or "splint bones," the two smaller bones of the lower part of the fore-legs.

P, P—The sessamoid bones—two small bones found in the substance of the tendons at the joining of the fore-leg to the ankle.

Q, Q—Phalanges, embracing: 1, the upper pastern bone; 2, the os corona, or lower pastern bone; 3, the os pedis, or first bone in the leg, inside the hoof—the coffin-bone; and naviculare, a small ship-shaped bone, at the back of the lower pastern, not marked in the figure.

R—The pelvis, or basin, composed of: 1, the ilium, or flank bone; 2, the pubis, or fore-part of one of the bones of the pelvis; 3. the ischium, or hinder and lower part of the hip-bone.

S—The femur, or thigh bone.

T—The patella, or small bone covering the stifle joint—the joint of the hind leg near the flank.

U—The tibia, or large, long bone between the hock and the stifle joint.

V—The fibula, the small, long bone behind and attached to the tibia.

W—The hock, or that joint of the hind leg between the stifle-joint and the fetlock, embracing the following small bones: 1, the os calcis, or back point of the hock; 2, the astragalus, or upper bone of the hock that supports the tibia; 3, the cuneiform magnum, or largest wedge-shaped bone; 4, the cuneiform medium, or middle-sized wedge-shaped bone; 5, the cuneiform parvum, or smallest wedge-shaped bone; 6, that small bone of the hock having a somewhat cubical form.

X—Large metatarsal, the front bone of the hind leg, between the hock and the pastern joint, below which are 1, 2, 3, the phalanges of the hind leg.

Y. The small metatarsal, or small bone of the hind leg in rear of large metatarsal.

Z—The head, embracing: 1, the inferior maxilla, or lower jaw; 2, the superior maxilla, or upper jaw; 3, anterior maxilla, or outer part of

the jaw; 4, the nasal bone, or bone in front of the nostrils; 5, the malar, or prominent cheek-bone; 6, the frontal or forehead bone; 7, parietal, the sides and upper part of the skull bones—(wall bones); 8, occipital, the bone of the hinder part of the head; 9, the lachrymal, or bone inclosing the lachrymal gland and duct; 10, the squamous, or scaly portion of the temporal bones; 11, the petrous, or hard part of the temporal bones inclosing the organs of hearing.

To summarize, the spine is divided into cervical, dorsal, and lumbar vertebræ, or joints, in all, thirty-one; the tail contains about seventeen joints; the dorsal vertebræ, with eighteen ribs attached on each side, and the breast-bone (which is not shown in the figure), form the thorax, or cavity inclosing the heart, lungs, &c.,—thirty-seven bones; the fore part is made up of forty bones, taking both sides together; the pelvis, or basin, of three bones; the remainder of the hinder part, of thirty-eight bones; the cranium of ten; the face and lower jaw of eighteen; of teeth there are forty (in the male); the small bones of the internal ear, taking both, are eight; and the hyoid, or tongue bone, consists of five parts.

It is not the province of this work to enter into minute anatomical descriptions; and for all really practical purposes the foregoing will be found ample.

It must however be borne in mind that a thorough study of the anatomy and frame work of the animal is absolutely necessary to a perfect understanding of how to breed, rear, care for, break and train an animal. At the same time, neither the horse breeder, trainer, or driver, needs to understand them so critically as must the veterinarian. The one repuires simply a general knowledge of the several parts, the other must understand intimately and critically each and every part, not only in itself but with reference to its bearing and influence on, and relation to other parts of the body. Thus what we give in illustration, while not going into minutia such as would be necessary to make the veterinary expert, will be fully sufficient for the instruction and every day use of the practical man, whether he be breeder, trainer, or simply the gentleman who drives for pleasure.

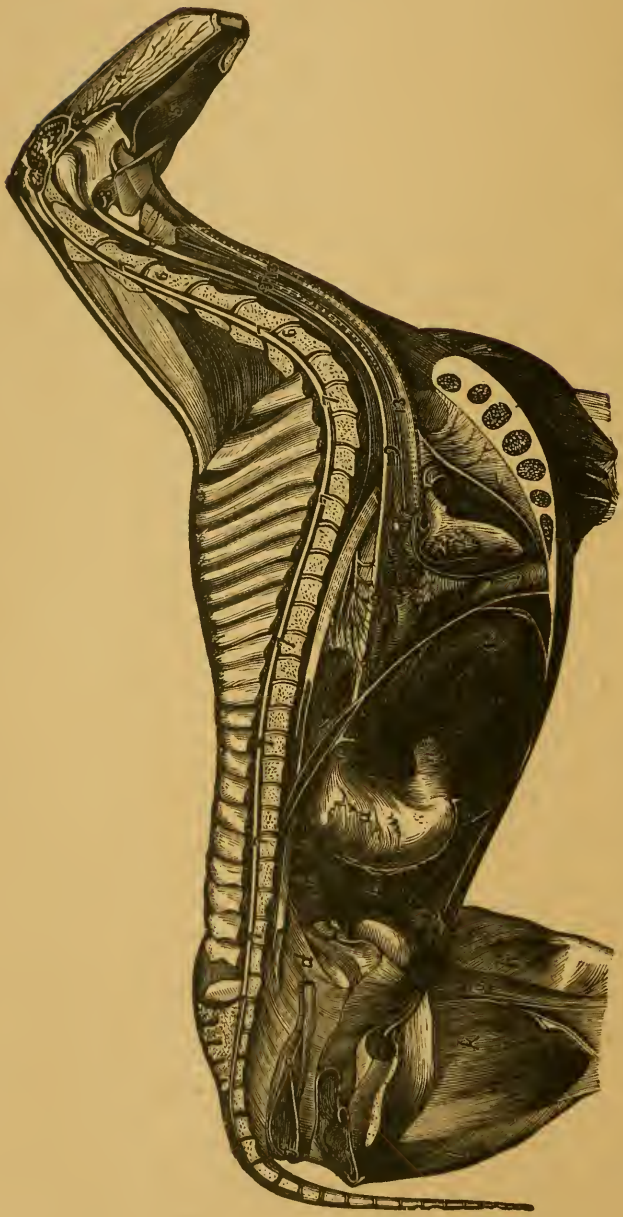


FIG. 2. LONGITUDINAL SECTION OF THORAX, ABDOMEN, PELVIS, ETC., WITH THE INTESTINES AND LIVER REMOVED.

Explanations.—1—The occiput, or that part of the skull which forms the hind part of the head. 2—The cerebellum, or hinder and smaller division of the brain. 3—The cerebrum, or front and larger division of the brain. 4—The nasal membrane, or cartilage between the nostrils. 5—The tongue. 6, 6—Joints of the neck bone, 7, 7, 7, 7—The spinal cord, or marrow. 8—The pharynx, or cavity bounded by the membraneous and muscular walls beneath the base of the skull, into which the nose and mouth both open, and which is continuous below the æsophagus. 9, 9, 9—The æsophagus, or passage through which food and drink go into the stomach. 10—The orifice of the stomach passing through the diaphragm. 11—The pylorus, or the orifice of the stomach through which the food passes into the intestines. 12, 12—The hinder surface of the diaphragm, or membrane which separates the stomach and bowels from the heart and lungs. 13, 13—The trachea, or windpipe. 14—The lungs. 15—The heart. a—The stomach. b—The spleen, or milt. c—The left kidney. d—The broad ligament of the uterus or womb, with the left portion, and the ovary or that part which contains the seed displayed. e—The rectum, or terminal portion of the large intestines. f—The anus. g, h, i, j, k, l—Internal muscles of the thigh.

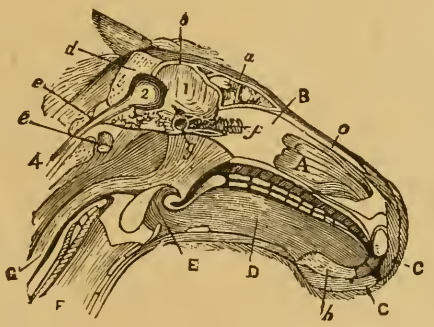


FIG. 3. VERTICAL SECTION OF HORSE'S HEAD.

This cut illustrates still more fully the structure of the head and its contents. a---The frontal bone, showing sinus or channel beneath. b---The parietal or wall bone, covering the brain. c---The nose bone. d---The occipital or back head bone. e, e---The Atlas, or first bone of the neck, showing the spinal marrow in its center. f--The ethmoid or sieve-like bone, through which the olfactory or nerve of smelling passes. g---The sphenoid or wedge-like bone, which, with the ethmoid, supports the base of the brain. h---Part of the lower maxillary or jaw bones, with the lower incisor teeth. 1---The cerebrum, or large brain. 2.---The cerebellum, or small brain. 3---The medulla oblongata, or upper portion of

the spinal marrow. 4—The spinal marrow. A—The turbinated bones, or thin, bony plates, in the form of a scroll or horn, found in the nostrils, and serving to give wider distribution to the lining membrane of the nose. B—The septum nasi, or cartilaginous division between the two nostrils. C, C—The lips. D. The tongue. E—The epiglottis, or valve of the larynx. F—The trachea, or windpipe. G—The æsophagus or gullet.

It will be observed that the great object in the formation of the cranium, that of furnishing a firm cover and a sure protector of the brain against all ordinary accidents, is secured by the employment of nine bones, arranged in this manner: The two frontal bones (a), make up the anterior or forward part; the parietals (b), comprise the upper and central parts, and cover the outer lobes of the cerebrum; the occipital bone (d), a single bone of great solidity, is at the back of the head; a little lower, and back of the occipital bone, is the aperture through which the spinal cord, together with some nerves and an artery, make their exit from the brain. Here the bone is smooth and rounded for the purpose of jointing with the atlas, the first bone of the neck. The sphenoid bone (g), forms the inferior and central part of the cranium. The ethmoid (f), through which the olfactory nerve passes, together with the sphenoid, as noted above, assists in upholding the base of the brain. In proximity to the facial bones are found sinuses bearing names derived from their nearness to particular bones.

The temporal bones forming the sides of the cranium are composed of two parts, the squamous, or scaly, and the petrous, or stone-like. The petrous portion of the temporal bone contains the organs of hearing, having upon its inside surface the openings for the passage of the auditory nerve; and upon its outside, large passages for the conveyance of sound

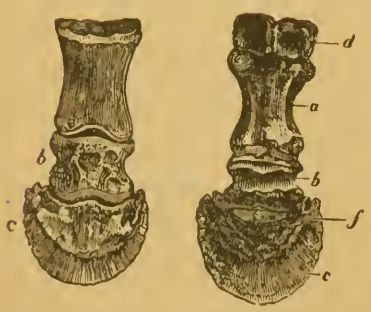


FIG. 4. FRONT AND BACK VIEW OF THE BONES OF THE FOOT.

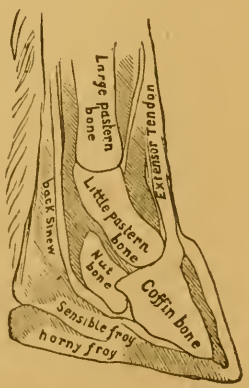


FIG. 5. SECTIONAL VIEW OF THE BONES OF THE FOOT.

Figs. 4 and 5, taken in connection, will serve to give the reader still more definite knowledge than that conveyed by the skeleton of the relative situation of the different parts of the horse's foot, and the terms applied to each. The bones exhibited in the front and back view, Fig. 4, are: c, c —The coffin bone, or first bone of the leg. d—The sessamoid bone. b, b —The small pastern. a, a—The large pastern.

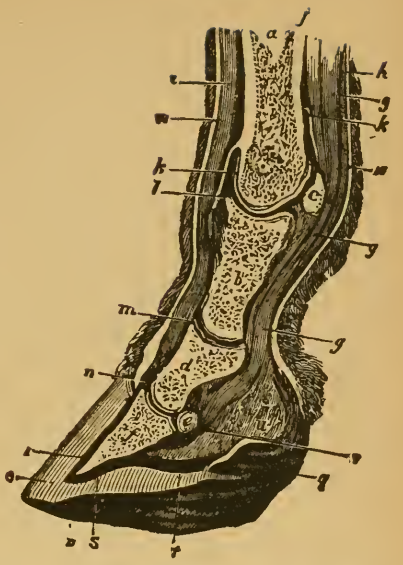


FIG. 6. VERTICAL SECTION OF THE FOOT AND LOWER LEG.

The parts exhibited by Fig. 6 are: a—The large metacarpal or cannon bone. b—The os suffraginis, or large pastern bone. c—One of the sessamoid bones. d—The os coronæ, or small pastern bone. e—The navicular bone. f—The os pedis, or coffin bone. g, g, g—The flexor perforans, or penetrating tendon. h, h—The flexor perforatus, or penetrated tendon. i—The extensor tendon. j—The suspensory ligament. k, k—The capsular ligament, or membraneous elastic bag surrounding the joint. l—The fetlock joint. m—The pastern joint. n—The coffin joint. o—The horny crust. p, p—The horny sole. q—The frog. r.—The sensible laminæ. t—The sensible frog. u—The cushion. v—The navicular joint.

It will be observed that the parts exhibited by Fig. 5 are plainly named on the engraving. Every thoughtful reader will observe further that these parts of the horse are most wonderfully put together. The delicate and well-adapted mechanism is not surpassed by that of any mechanical combination ever produced. The entire structure is one that secures the utmost elasticity and freedom of movement, with the immense strength needed in the usual work of the horse. An understanding of this must go far toward compelling care and attention in all that pertains to the foot of the animal. Shoeing, and especially service on rough, stony places, should be subjects of constant regard.

The next cut furnishes a beautiful and comprehensive view of the terms applied to the various parts of the animal, and it can but prove of great use to those who would not only "talk horse" themselves, but understand the talk of others—especially of veterinary writers when treating of disorders, their location, and the proper means for their relief. As these parts are known among all veterinary writers of any prominence, by the names re-

spectively given to them here, it is evident that in order to intelligently comprehend the directions, not only of this work, but of any other worthy authority, the reader should be perfectly familiar with the "Points" of the horse as given in this illustration.

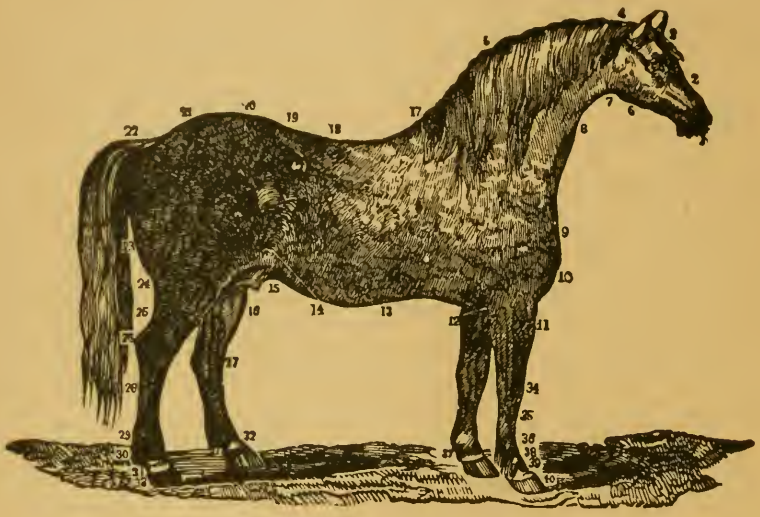


FIG. 7. EXTERNAL PARTS OF THE HORSE.

Explanation.—1. The muzzle. 2—The face. 3—The forehead. 4—The poll. 5—The crest. 6—The jowl. 7—The gullet. 8—The windpipe. 9—Point of the shoulder. 10—The breast. 11.—The arm. 12—The elbow. 13—The girth. 14—The flank. 15—The sheath. 16—The stifle. 17—The withers. 18—The back. 19—The loins. 20—The hip. 21—The croup. 22—The dock. 23—The quarter. 24—The thigh or gaskin. 25—The hamstring. 26—The point of hock. 27—The hock, (hough) 28—The cannon bone of hind leg. 29—The fetlock. 30—The large pastern. 31—The small pastern. 32—The coronet. 33—The hoof. 34—The knee. 35—The cannon of fore leg. 36—The fetlock. 37—The heel. 38—The large pastern. 39—The small pastern. 40—The hoof.

CHAPTER III.

HOW TO TELL A HORSE'S AGE.

KNOWLEDGE OF CHANGES IN THE TEETH THE ONLY MEANS.——THIS CHAPTER TO BE STUDIED IN CONNECTION WITH THE ACCOMPANYING CHART.——BUYERS LIKELY, WITHOUT THIS KNOWLEDGE, TO BE DECEIVED.——INCISORS CHIEFLY TO BE RELIED ON.——CONDITION OF A FOAL'S MOUTH.——THE CHANGES THAT FOLLOW.——HOW FOAL TEETH ARE TO BE DISTINGUISHED FROM HORSE TEETH.——WEARING AWAY OF THE GRINDER OR ENAMELLED PORTION.——NUMBER OF TEETH IN A FULL-GROWN ANIMAL.——DIFFERENCE BETWEEN HORSES AND MARES AS TO NUMBER.——INCISORS, HOOKS, AND "WOLF'S TEETH."——HOW TO DETERMINE AGE TILL FOAL IS TWO YEARS OLD.——HOW FROM TWO TO OLD AGE.——THE HORSE OF MEDIUM SIZE TO BE TAKEN AS A STANDARD.——SHOOTING UP AND GRINDING OFF.——IRREGULAR TEETH; HOW TO JUDGE.——PECULIAR HARDNESS OF BONES AND SLOWNESS OF CHANGE IN CERTAIN BREEDS.——THE MULE; AGE HARD TO FIND OUT WITH EXACTNESS.——DECEPTIONS; HOW TO DETECT.——CRIB BITERS; HOW TO EXAMINE.——TERMS DEFINED.

The age of a horse is to be accurately determined only by an examination of the teeth, with a knowledge of the changes which, from time to time, take place in them. The following directions, studied in connection with the drawings exhibited on the accompanying chart, and the explanations written under them, will enable any one of ordinary acuteness and powers of observation, to judge for himself, and thus to avoid that most common of all the jockey's impositions, a liability to be deceived in the age of horses held for sale.

The incisors furnish the chief indications; and to them the attention must be mostly directed; but the back and hook teeth should be observed to some extent, as their condition may occasionally serve to correct and more frequently to corroborate the indications of the incisors.

When first foaled, the colt has no incisors. Twelve back teeth have in most cases forced their points by this time through the gums; but it is not until from two to three months afterward that the four nippers appear; in six weeks the nippers are seen; and in about eight months the four corner teeth. There are now, at eight or nine months old, twenty-

four teeth, (upper and lower), called *foal-teeth*. These are all changed by the fifth or sixth year, and those that follow are called *horse-teeth*.

The back teeth appear as follows: the three front double pair are seen at birth, and are afterward changed; the fourth double pair appear from the eighth to the ninth month; (this fourth double pair are the first that remain stationary, and they are found in every year-old colt); the fifth double pair, or fifth four, appear in the second or third year; the sixth, usually in the fourth or early in the fifth year. These three double pairs of back teeth (last named), remain unchanged, as do also the four hook teeth.

The hook teeth are uncertain as to time of appearance, coming some times at the end of the third year, sometimes in the middle or at the end of the fourth, sometimes in the middle or at the end of the fifth, sometimes at the beginning of the sixth.

Observe particularly that the incisors of the foal differ from those of the horse: (1) By their regular, conical formation; (2) by a narrow contraction called the neck, visible almost in the center of the body of each tooth, while nothing of the kind is seen in horse-teeth; (3) by their smaller size, even when full grown. The milk teeth, (or those teeth which are cast or shed), taken from the jaws of dead foals and compared with horse-teeth similarly obtained, are found to be only about half as long as the latter. The breadth is not to be depended on, since the milk teeth of large foals appear almost as broad as those of small horses. When the nippers become horse-teeth, they form a great contrast to the middle and corner teeth. The size of these last will at once show them to be milk teeth. (4) By the fact that the outer surface of the foal-teeth is smooth and striped with brown, while on horse-teeth the same surface is divided by a dirty yellow indentation inclining toward the center, which is sometimes double upon the upper teeth.

One should study the form of the incisors by carefully examining those taken from dead horses of different ages. Each incisor will be found to consist of a hard, enamelled part, called the grinder, which has protruded above the gum; of a bony substance, which has been for the most part hidden in the gum; and of a root, which has occupied the cavity of the jaw-bone.

These teeth, (of the foal as well as of the horse), are slowly but continually worn away by biting and chewing, so that the length is constantly decreasing,—sometimes evenly and regularly,—so that in old age the tooth that was once two and a half or three inches long is found to be not exceeding half an inch in length. The breadth generally decreases in about the same proportion; but with this difference in foal and horse-teeth, that the thickness and breadth of foal-teeth are constantly decreas-

ing from the grinder or hard enamelled part to the end of the root, while horse-teeth decrease from the root upward. The grinder, or hard, grating portion of the tooth, which has not yet been used, has somewhat the form of an egg; it is three times as broad as thick, and hollowed out in the shape of a funnel, which hollow has two sharp edges inclosing it. This socket or hollow is called *the mark*. In the center of this mark, a sort of kernel may be seen—a tube commencing at the end of the root—that contains the nerves of the tooth; but this inner hole must always be distinguished from *the mark*, which is the outer depression, lying next to the sharp edges. The inner cavity is a funnel-shaped socket, of hard, enamel shell, around which, and inside the outward shell, is a thick fluid, which remains during the life of the tooth, becoming, by degrees, gray matter. This fluid averages about four lines in depth in the lower incisors and about eight in the upper ones.

The outer edge of each incisor always rises a line or two above the inner edge; therefore, when the upper and lower are first grated together, only the outer edges touch for some time; and the inner edges do not touch until the outer ones are worn down to an equal height with them. Horse-teeth generally do this in about one year. At the age of two and a half, the teeth begin to change, and those which then appear are called *Horse-teeth*. (See chart, Fig. 7, A).

A full grown stallion or gelding has 40, and a mare 36 teeth—the male having four hook teeth which are lacking in the female, except that sometimes she has imperfect teeth in the corresponding part of the mouth. Those teeth found in some young horses, next to the first double teeth, and called "wolf's teeth," are not included in this number, as they are not real teeth,—frequently not breaking through the gums at all, and usually, in any case, disappearing in eight or nine years. Twenty-four of the true teeth, in both horses and mares, are situated in the upper part of the mouth, (that is, in both jaws, *above the lips*). They are divided into six double pairs, counting upwards from below, so that those situated next to the incisors in all the four rows are first; those next to them, second; and so on to the last pair, which are called back teeth.

Twelve others are in the lower part of the mouth, surrounded by the lips, six in the upper and six in the lower jaw, standing, each lot, in the form of an arch, and occupying the entrance to the hollow of the mouth. These twelve are called incisors. The four innermost, two in each jaw—those forming the key of each arch—are called nippers; the other two in each arch are called corner teeth; and those between the nippers and the corner teeth are called middle teeth. Each of these teeth in the lower jaw rubs against the corresponding one in the upper jaw. The teeth of the upper jaw are broader and thicker than those of the lower. The four

hooks are seated alone, over each corner tooth, but nearer to the corner teeth of the upper than those of the lower, so that they, (the hooks), never come in contact with each other.

The horse has always attained the age of four and a half or five years before he has a full number of perfect teeth. Before this time, the younger the animal the fewer the teeth, and even these are not all permanent.

The more a permanent incisor loses in length, by friction, the more it also loses in width, so that the nearer the friction surface approaches to the root, the narrower and thicker it must appear.

Every new hook tooth is cylindrical and somewhat hooked, with a cone-shaped projecting grinder, and this is surrounded by a spoon-shaped edge, turned toward the hollow of the mouth, so that the cone cannot be seen from the outside; and the whole grinder, or hard, enamelled part, has the appearance of the back part of the bowl of a spoon—the edge, like a screen, surrounding the short cone, but so that two deep furrows remain between. Except this grinder, the rest of the body is uniformly round, and the surface almost even. As previously said, however, these by themselves afford no reliable indication as to age.

Figures 2, 3, 4, 5, 6 show how the age of a colt may be determined till he is two years old. The following further explanations, taken in connection with the chart from Fig. 7 to Fig. 46, inclusive, will teach how the age, from two to thirty, can be ascertained.

Large horses have, of course, larger teeth than small ones; but taking a horse of medium size as a standard, one can make allowances for either larger or smaller, and easily arrive at just conclusions.

The incisors being our main reliance, our remarks must be understood to refer chiefly to them. The length of the tooth of a horse of medium size is three inches, or thirty-six lines. After the changed tooth has arrived at its proper length, *it shoots up a line* regularly every year, and if the teeth stand right, *the grinder is worn off a line every year*. It is also, as has been said, worn off in both width and breadth, so that the grinder becomes, from year to year, shorter and smaller, as shown by the chart.

If, however, the teeth stand too far forward, (irregular teeth, see chart, Fig. 41), they do not wear down in the same proportion as they shoot upward, and they become very long. The age in this case can be ascertained with ease and exactness by observing directions given under Fig. 41, and noticing with care the following points: At the age of five years, the corner teeth of the lower jaw have grown up five lines above the gum; each middle tooth, seven lines; and each nipper, nine. At eight years, and older, each corner tooth of the same horse projects only

four, the middle teeth, six, and the nippers, eight lines above the gums. This is absolutely necessary to be taken into account, because it is the only means by which one can decide with certainty as to the age of a horse whose teeth have become longer than they would have been if set right and wearing regularly.

The foregoing remarks and directions are based upon the assumption that there is no peculiarity about the individual animal or the breed to which he belongs that would materially interfere with the principles laid down. It remains, however, to notice that to those breeds of horses which develop very slowly, of which the Spanish horse may be cited as an example, the rules are a little more difficult of application. The bones of these, and perhaps of some few other kinds, seem to be harder, and the teeth change somewhat later and appear to wear down more slowly; so that it sometimes happens that such horses, after their fifth year, appear a year or two younger than they really are; but the same animals are apt to be more than ordinarily strong, hardy, and long-lived, and to be taken at a diminished age really detracts nothing from their worth.

The age of a mule is somewhat difficult to determine with exactness, owing to the cause just stated.

Deceptions may be practiced with very thrifty young horses, when it is desirable to make them appear of suitable age for work or for breeding, by knocking out the incisors a year sooner than they would naturally change themselves. If a purchaser suspects deception, he can determine the matter by closely examining the remaining teeth. If the nippers have changed, and the inner edges of the corner teeth have not yet come into contact, the foal is but one year old — and so on.

The opposite cheat — that of trying to make a horse appear younger than he really is by burning artificial marks in upon the teeth — can be detected by closely examining the enamel and the effect of the mark upon it. When a horse has reached an advanced age, say twelve to twenty, the enamelled surface has become so minute that burning in as large a mark as is found in horses considerably younger would disturb the whole enamel and so leave a means of detecting the fraud.

In the case of crib-biters, that wear out their teeth prematurely, and so appear really older than they are, examination must be directed to the corner teeth, which are seldom injured; or, if the corner teeth prove to be injured, deduct from the apparent age as many lines as are wanting to make the teeth of the natural length. To feed constantly, from weaning time, upon hard, unshelled corn, sometimes produces the same effect as crib-biting, and the same directions must be followed in forming an estimate.

We close the chapter with a short vocabulary, by reference to which the reader may more readily apprehend the meaning of the terms employed in the ensuing chart.

INCISOR.—A cutter; a fore-tooth which cuts or bites. In the horse, those twelve teeth, six in the upper jaw, six in the lower, which are surrounded by the lips, are called incisors.

GRINDER.—As used in the present chapter, it denotes the hard, grating, upper portion of the front teeth.

LINE.—One-twelfth of an inch.

MARK.—As used with reference to horse teeth, it denotes that depression in the grinder lying inside the sharp edges and adjacent to them.

NIPPERS.—Those two teeth in each jaw that occupy the middle of the semi-circular row.

CORNER TEETH.—The two outer of the six front teeth in each jaw.

MIDDLE TEETH.—The teeth between the nippers and the corner teeth.

HOOKS.—Four teeth, two in each jaw, situated over corner teeth, or beyond the incisors, reckoning from the front of the lips, and having a cylindrical and somewhat hooked shape.

MILK TEETH.---The front teeth of a foal which appear at about three months of age and are cast within two or three years.

CHAPTER IV.

DIFFERENT BREEDS AND THEIR CHARACTERISTICS.

I. THE INFERIOR VARIETIES: MANY FOUND IN BOTH HEMISPHERES. SOME GOOD, BUT LITTLE KNOWN OF THEM.——II. SOME CONSIDERED AS TO WORK RATHER THAN BREED; THE FARM HORSE; THE HUNTER; THE HACKNEY; HORSES FOR HEAVY DRAFT.——III. THE ARABIAN.——IV. THE BARB.——V. THE ENGLISH THOROUGHBRED.——VI. THE PERSIAN.——VII. THE TURK.——VIII. THE TURKOMAN.——IX. THE EGYPTIAN.——X. THE DONGOLA.——XI. THE NORMAN PERCHERON.——XII. THE THOROUGHBRED IN AMERICA.——XIII. THE MORGAN.——XIV. THE NARRAGANSETT PACER.——XV. THE CANADIAN.——XVI. THE CONNESTOGA.——XVII. PONIES.

I. The Inferior and Little Known.

Among the great variety of horses there are many that are either of inferior importance or so little known that it is deemed unnecessary to notice them in detail. India, China, Japan, Siam, several of the European States, and North and South America, have horses that are in some instances widely different from each other, as well as from the approved breeds; but they are not known to possess any remarkable excellence, or any distinctive points that are constantly reproduced in their offspring,—so that a mere casual reference to them, with very general statements as to qualities and characteristics, is considered to be sufficient.

In India alone there are various stocks, known to have been so long in the various regions of that great country as to seem native to the soil; but with the exception of the Turko, recognized to be a cross between the Turkoman or South Tartary breed and the Persian, they are regarded as cold blooded and inferior. The Turko is said to carry himself in a grand and stately way, and to be both beautiful and tractable.

The Tartar and Calmuck horses, with the exception of the Turkoman, which is described elsewhere in this chapter, are for the most part small and ill-made. They are hardy, however, being able to perform great journeys, with burdens disproportioned to their size, and to live on the poorest fare.

The horses of China are small, and have no points of excellence as to either shape or spirit.

The horses of Turkestan have been described by some as having heavy heads and ewe-necks, with long legs and a scanty body; while others speak of high crests and long, bony bodies, and assert these horses crossed with those of Persia, produce magnificent animals—elegant, active, strong, and larger than the best Arabians. In Bokhara is a breed of small and shaggy but stout horses, called Kussaks, which has attracted some attention. Their manes and tails are long as compared with their general make up.

Belgium, Holland, and the German states have breeds of horses noted only, or chiefly at least, for being large, strong, and well-formed, and admirably adapted to purposes of heavy draft.

In the forests of Sweden, Finland, and Norway is found a race of horses in a half wild state, from which the inhabitants, without taking upon themselves the trouble of breeding and rearing, supply themselves when the creatures are wanted for use. They are small, but well-formed, active, and spirited.

The Hungarian horse, though evidently of the same origin as those of Germany, is somewhat lighter than they, and possesses more spirit and action. He shows some signs of oriental blood, to which he probably owes his superiority to his neighbors.

The horses of Iceland run at large and pick up their own scanty fare, wherever they can find it, until they are needed by the inhabitants, when they are caught and subjected to use. The origin of these animals is in doubt. Some assert that their progenitors were carried into that island from the forests of Sweden; others, that they were of the stock of ponies found in the Scottish isles. They are small, but active, and generally well disposed.

The horses of Italy were formerly much better than now. Few of them may at present be regarded as possessing any striking excellence. There are said to be some, among the people of Naples, that are large, of fine appearance, and excellent as carriage horses.

The French people have many breeds, adapted to the saddle, the light carriage, cavalry, and light artillery, besides those that are required for the plow and the cart. The most famous among them is the Norman, or Norman Percheron, which is described elsewhere in this chapter.

The fact is well established that the horses of Spain, previous to the Moorish conquest, were possessed of many noble qualities; but they were much improved by a mixture of Barb blood, consequent upon the invasion and the introduction of horses from the Barbary States. They

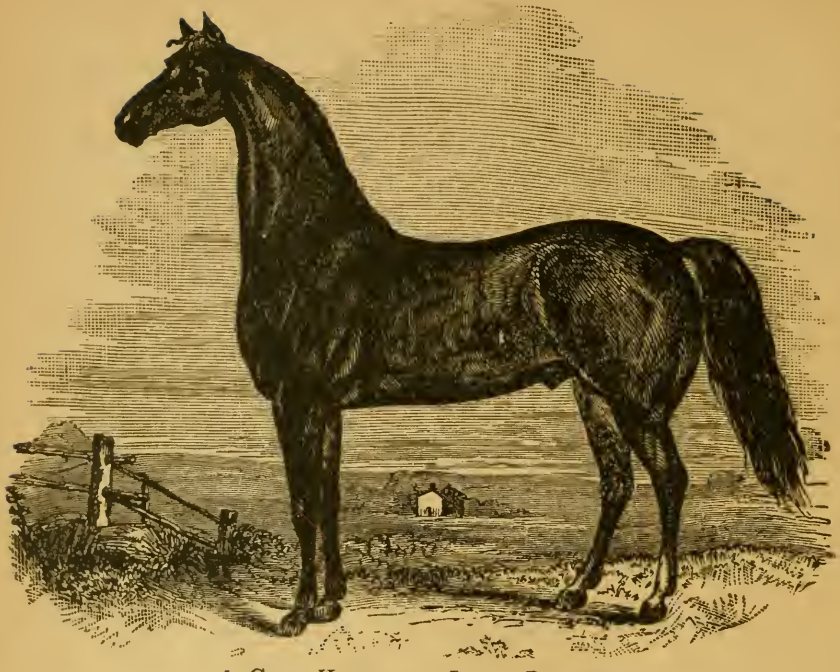
still show both their original and derived excellences; and a pure-blood Spanish Barb is a fine and beautiful creature.

In the plains of South America, Mexico, Texas, and the Western Territories of the United States are found great herds of wild horses, of which there are different varieties, though they must have had a common origin, as we have stated in Chapter I. Chance mixture with horses imported into the country subsequently to those brought from Spain, together with the influences of different climates and food to which they have long been subject, may perhaps account for this. The most marked types of these wild Americans are the Mustang and the Indian ponies, which are noticed on succeeding pages. As a general thing they retain the striking characteristics of their old Spanish or Andalusian progenitors; in size, shape, and spirit they show whence they are derived. Their heads are pretty and their limbs clean. They are capable of great endurance; and though not especially rapid in action, it is related of them that they are sometimes ridden at the rate of ten or twelve miles an hour for a stretch of eighty miles, without anything more than a temporary halt and such little food as could be hastily eaten. Seldom is any gait known among them except a walk and a lope; but an occasional pacer is discovered. Many of them do well for the saddle; but care is required in handling them. In the hands of the cruel or inconsiderate, their wild nature returns to them, and they become intractable and even dangerous.

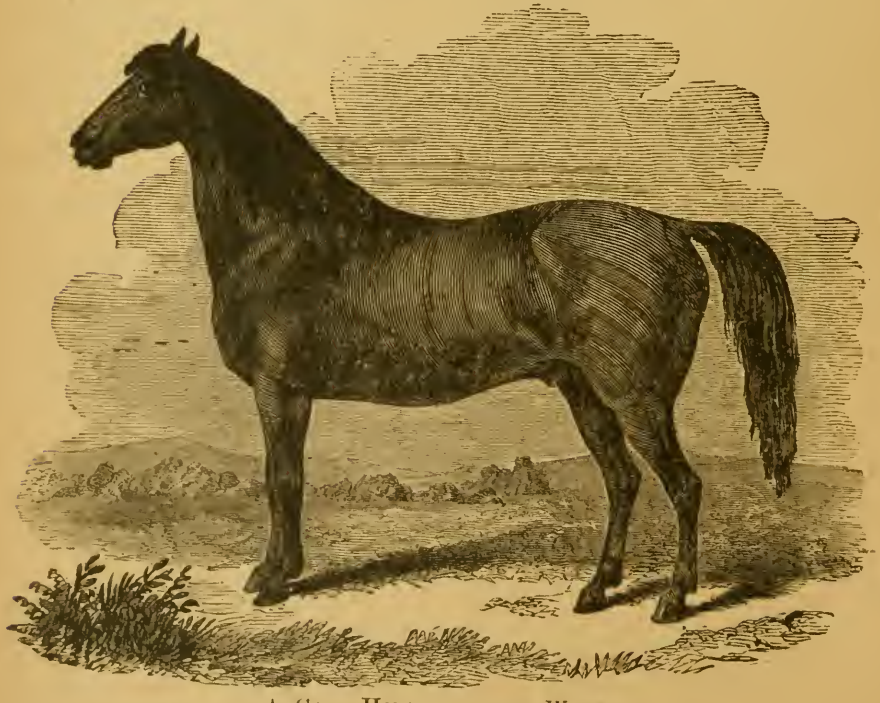
II. Some Considered as to Work, rather than Breed.

In treating of the different stocks and specifying distinguishing points, it is perhaps not amiss to consider some characteristics that should mark animals chosen or set aside for special purposes. And yet in this consideration it must not be forgotten, that very few horses, comparatively, are kept for but one class of duties. Few horses are for the saddle exclusively, as compared with those who render service in harness at times, as well as under saddle. And so with other grades of horses. A varied work is usually required, and especially so among farmers, and the well-to-do residents of cities and villages.

The good *farm horse* cannot, of course, be confined to any particular breed. If he combines within himself certain desirable qualities, it is not pertinent to inquire particularly what blood he carries. Some points that should distinguish him may be thus enumerated: He should be close-built and strong, but not gross and clumsy, since he is to serve as a sort of horse of all work—doing duty, by turns, under the saddle, and before the plow, the farm-wagon and the carriage.



A Good Horse for Light Driving.



A Good Horse for all Work.

Fifteen to sixteen hands mark the proper stature; and his limbs should be sinewy without absolute heaviness, while his feet should be of medium size. He should be reasonably springy under the saddle, and active, without dash, in light harness. To these he should add a certain thriftiness, that will enable him to appear well even under good, close work, if well treated; and in temper he should be mild. His breaking in and training should have been such as to render him readily adaptable to any work that he may be called upon to perform about the country home.

The *hunter*, or horse for the chase, speaking with reference to a pastime which is still common in England, but to which little or no importance is attached in this country, is usually the better esteemed for having some blood, but more for the absolute feats of speed and leaping which he may be able to perform, and for his ability to stand a hard day's run.

The best hunters are said to be a combination of the thorough-bred with some coarser animal—producing more strength, substance, and hardihood, with less length of body. He is at the present time what may be called three-quarters bred; and he is lighter and more fleet than formerly.

The engraving upon the page next following, entitled "A light hunting horse," conveys an excellent idea of what this horse is now most commonly found to be.

That is to say, a horse of good style and form, capable of long continued exertion under the weight of an ordinary sized man, and also capable of showing as high a rate of speed as possible, combined with an aptitude to leap successfully such obstacles as may ordinarily interpose In all this class of horses, whether they be light or heavy weight animals, blood—that is, the possessor of a fair amount of thorough blood as transmitted by thorough-bred sires—is absolutely necessary. It gives style, form, hard and fine bones, muscular tissue, lung power, and all this means endurance to perform feats under which the cold blooded horse would soon succumb. Such a horse as the engraving shows will not only make a capital saddle horse, but also a most valuable horse for general utility, if properly broken, good for the light carriage and buggy and good also at a load if properly trained and handled; but let it always be remembered that in as much as you put a saddle horse, and especially a hunting horse, to labor, you detract from his value in the field. This is to be regretted possibly, especially by those of somewhat limited purse, but such is the fact nevertheless. The best work in many lines cannot be had at one and the same time from one and the same animal. Excellence in some points necessitates unfitness elsewhere.

During the last century, however, and the first of this, it was deemed essential that he should be a heavier horse—an animal capable of making

A Light Hunting Horse.

prodigious leaps while carrying a heavy weight. This type is well represented by the subjoined cut of "A heavier hunting horse."

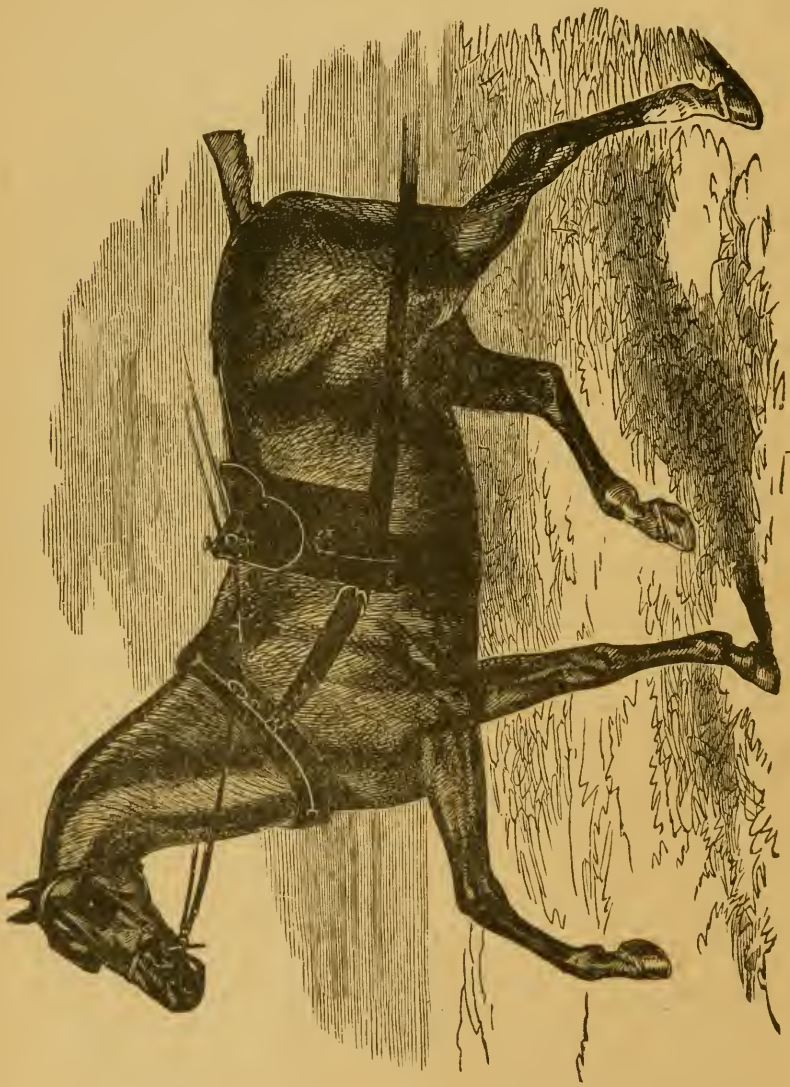
The HACKNEY, as the horse of all saddle and light harness purposes, the common roadster, or general knock-about, is termed in England, may be considered in pretty much the same light as the good farm-horse pre-

A HEAVIER HUNTING HORSE.

viously noticed. Among the English people it seems to be essential that an animal must at least be supposed to possess some blood before he can be considered a good hackney. When known, or believed, to have a

streak of the thorough-bred in him, and to possess the following characteristics, nothing more is desirable:

He must be about fifteen hands high; both his fore and hind parts must be strong and well muscled; he should be short in the back and well coupled; his chest should be wide and deep, allowing full play for



AN ENGLISH ROADSTER.

the lungs; his head should be light and his neck carried well up; his limbs should be clean and bony, and with somewhat oblique pasterns; he should be quick and springy; and in temper he should be kind and easily controlled.

Of Heavy Draft Horses there are several breeds in both England and the United States; or rather, several kinds that have some of the blood and some of the characteristics of the old heavy draft animals. When it became the fashion in England to seek admixture with the heavy mares and stallions of Belgium or Flanders, the English draft stock was really much improved, though several English breeds soon lost thereby, for the most part, their identity.

An English Coach Horse. Heavy Draft

The Cleveland Bay, a powerful horse, though not of extraordinary size, was found chiefly in the four Counties of Yorkshire, Durham, Lincolnshire, and Northumberland. He was capable of carrying a great weight, and of maintaining under it a rapid rate of speed. A lighter horse, and one better adapted to the carriage, was produced by crossing the

Cleveland mare with a good-sized thorough-bred stallion. The best hunters and hackneys, having an arched crest and proud action, were produced by crossing the Cleveland mare with a horse lighter than the true thorough-breds, yet possessing real spirit and quick movement. The Cleveland, as a distinct breed, is nearly extinct.

The Suffolk Punch is considered to be an excellent heavy draft horse. He is believed to be the offspring of the Suffolk cart-mare and the Norman stallion. When further crossed with the Yorkshire half-bred, (the product of the Cleveland Bay and the thorough-bred), he is active, spirited, and indomitable at a pull.

The Suffolk, now hardly known as a distinct breed, was a horse of good size, being ordinarily from fifteen to sixteen hands high, and very stout in proportion. His distinguishing color was sorrel; he had a large head; his shoulders were thick on top and low; his chest was round and deep; he had round legs and short pasterns; his back was long; his croup high; his flanks full; his quarters heavy and strong; and he was every way a spirited and determined animal, active and enduring.

The Clydesdale horse, found principally on the Clyde in Scotland, was the product of certain Scottish mares with Flanders stallions. He is a larger horse than the Suffolk, but less clumsy in appearance, as his head is better and his barrel lighter. He has a long neck and deep legs; and is strong, hardy, patient, and a faithful puller. Some of the horses in the United States said to be of this stock preserve most of these characteristics, but their bodies are rounder and their necks are not particularly noted for length. An extended description will be given farther on.

Between Lincolnshire and Staffordshire, in the midland counties of England, is found what is called the Heavy Black Horse, a large, well-built animal, of splendid appearance, and much in demand in London and elsewhere as a wagon-horse; but no horses of this particular kind are known to have been brought to America for breeding purposes.

Of American heavy draft stock, the Vermont cart-horse is deserving of special mention. He is said by one who is considered good authority to exist in Vermont and adjacent States as a distinct breed, and to be the very model of what a good cart-horse should be—quick and full of power, yet easily managed. As a general thing, he has a well-set head, a lofty crest, thin withers, mane and tail medium, and clean fetlocks. He has sufficient action to insure a good rate of speed, and makes, upon the whole, a fine show.

His origin seems doubtful. There is a pony appearance about him, though often more than sixteen hands high—his peculiar shortness of back, roundness of body, and general compactness contributing to make

CLYDESDALE STALLION, "GLADSTONE"

Three years old. Imported and owned by John Duff, Esq., Everton, Ontario. No. 1439, Vol. III., Clydesdale Stock Book.

him seem much less in bulk than he is found to be by actual measurement.

III. The Arabian.

We come now to notice some of the most distinct, strongly marked, and valuable breeds, among which the Arabian, or that species of the Arabian best known to us, is justly celebrated.

Whether the present pure blood Arab is native to Arabia or imported; whether of recent origin or of a lineage as ancient as the sculptured ruins of Nineveh and Babylon, it is needless to inquire; but the people of that country claim that they have authentic pedigrees reaching back for more than two thousand years; while on the other hand, it is asserted by some who have tried to discover the real origin of this famous stock that prior to the thirteenth century the horses of Arabia were a poor race and lightly esteemed. Be that as it may, the horse of the present day, so renowned throughout the world, undoubtedly began to attract notice some five or six hundred years ago, since which time he has grown into his great repute; and now the best horses of most civilized lands are thought to derive their highest claims to noble descent from the Arabic Kochlani, and those of his congeners that have shared his excellences.

In a subsequent chapter the subject of breeding will be appropriately treated; but we may advert here to a singular fact in connection with the sons of the desert and the horse that shares their name and their affections. So thoroughly are the principles of breeding understood among them, or such is their extraordinary care, (and perhaps climatic influence may have something to do with it), that their horses long since reached a degree of perfection unrivalled in any country, and this perfection is steadily maintained.

Travelers differ as to the number and names of the distinct breeds of horses which are found in Arabia; but a comparatively recent Mohammedan writer, who seems to have had more than ordinary opportunities for knowing the facts in the case, has stated that there are six distinct breeds, which he names and characterizes thus:

(1) The Dgelfe, found chiefly in Arabia Felix, seldom seen at Damascus, but common in the neighborhood of Anaze. Horses of this breed are of lofty stature, have narrow chests, but are deep in the girth, and their ears are long. They are remarkable for spirit and fleetness, but are exceedingly tractable, and their ability to endure hunger and thirst is a remarkable feature. A two-year-old colt, he says, will cost in his own country two thousand Turkish piasters.

(2) The Secaloni, a breed from the eastern part of the desert, somewhat inferior to the Dgelfe, though resembling him in most points.

(3) The Mefki, he informs us, is a handsome horse; but he is not so fleet as either the Dgelfe or the Secaloni. In figure, he bears a resemblance to the Spanish or Andalusian stock.

(4) A fourth breed is called the Sabi, which is similar to the Mefki, but seems to possess no specially useful or striking qualities.

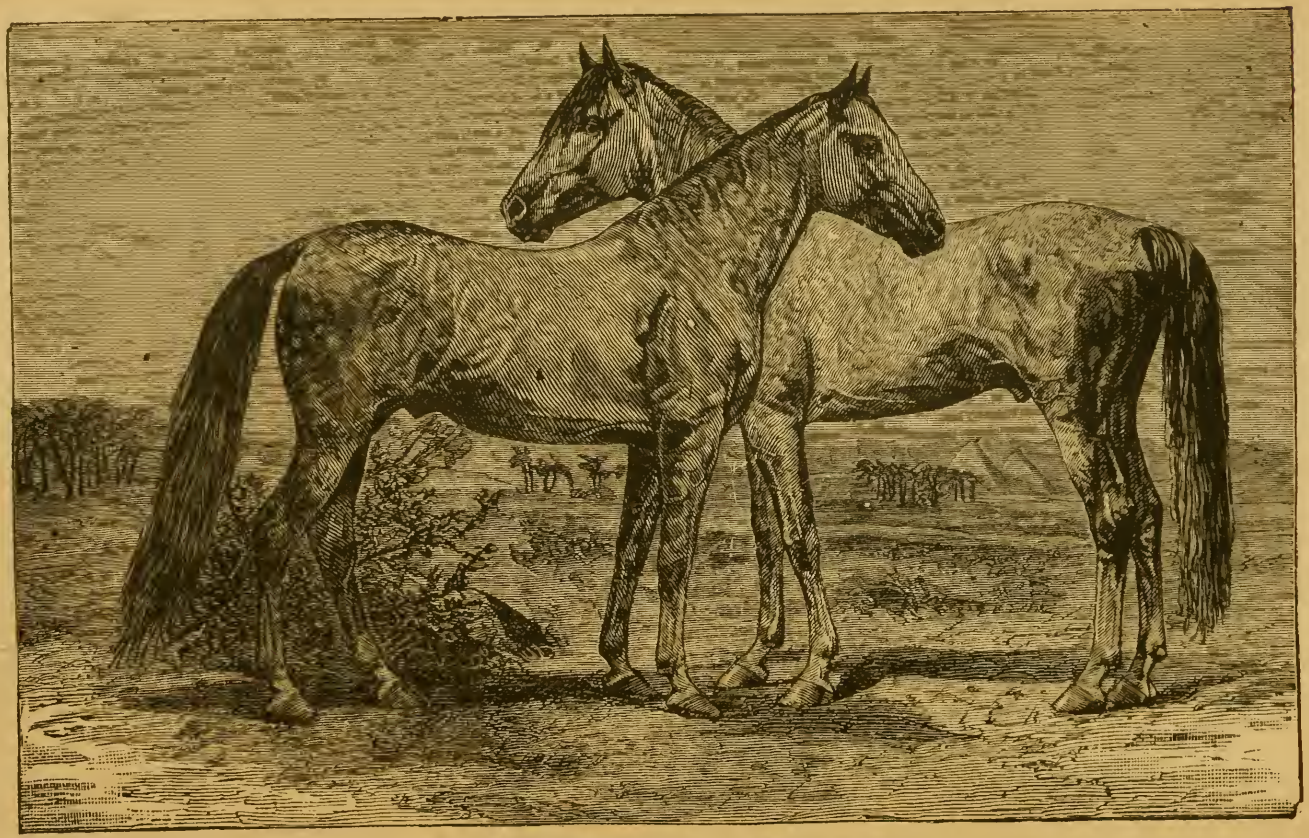
(5) The Fridi. This breed is very common; but they are often vicious and untrustworthy, and lack some of the excellent qualities possessed by the best of the others.

(6) The Nejdi, found chiefly in the region of Bussorah. These are said to be at least the equals of the Dgelfe and the Secaloni. Some judges assert that there is no horse to be compared with them, and they stand very high in the market.

This writer considers the Dgelfe and the Nejdi to be the most valuable. They are known to be the favorites of the horse-fanciers of India, many fine animals of these stocks having been carried thither by the sportsmen of that country.

Other writers make mention of but three distinct breeds, to which they attribute names different from those above given; and it is difficult to reconcile the statements of the two, and to determine whether they have really agreed in any way in pointing out the same animal, though by diverse names, as possessing the striking excellences which have made a certain breed famous and well known to us. Writers of the latter class speak of an inferior race, little esteemed, at home or abroad, which they call the Attechi. These are sometimes found in a wild state. Then come the Kadischi, a sort of half-breed stock, possessing some points of resemblance to the true blood, and being sometimes imposed upon dealers for the genuine. Finally, they describe a superb race, the pure descendants of some extraordinary ancestors, and these they call the Kochlani or Kailhan. The best of them are found among the Shammar and Aneyza tribes. The Arabs themselves pretend to trace the Kochlani back to the days and the stables of Solomon. While this cannot be credited, it is known that some of them have written pedigrees for at least four hundred years, kept with the most extreme care, and always on the side of the mare. These animals are sometimes sold to foreigners; but they bear almost fabulous prices, and it is believed to be a very rare thing for a true Kochlani to fall into the hands of a stranger.

The striking points of the pure Arab may be thus stated: In size, he is considerably smaller than the modern thorough-bred, scarcely ever exceeding in height fourteen and a half hands. His head is extraordinary for its beauty,—the forehead being broad and square, the muzzle short and fine, so that some of them seem as though they could really "stick their noses into a tumbler." The face, upon which the veins appear



FINE SPECIMENS OF ARABIAN STALLIONS.

These are perfect pictures of the two fine Arabian stallions presented to General Grant by the Sultan of Turkey, on the occasion of his great tour *Around the World*. Engraved from original photographs made from life by Schreiber & Sons, Phila. (Copyrighted.)

beautifully coursed, is bony; the nostrils are wide; the well-set ears are small, while the eyes are large, prominent and brilliant. The neck, rising beautifully from the shoulders, and well arched, is very fine; the withers are high and moderately thin; the shoulder, inclining backward, is perfect in form and position—muscular as well as finely shaped. The body is light and narrow before; but behind the arms the chest is expanded and affords sufficient capacity for the lungs; the hips, though somewhat narrow, are well united to the back, and the quarters are strong, muscular, and well set. The legs are small, flat, sinewy; the pasterns are oblique in their position; the croup is high, while the tail is set on with considerable arch. The muscles of the arm, like those of the ham, are full and strong. The bones of the leg are large in proportion to the size, there being no superfluous fatty matter, but full, free, strong, and clean tendons and suspensory ligaments. The hocks are large, but free from both curbs and spavins; while the feet are small and sound. The elbow joint is prominent but fine, and generally plays clear of the body.

Especially does the Arab differ from other breeds in the superior fineness of his muzzle; the somewhat hollowed but graceful face; the fully developed jaws that yet give no impression of heaviness; the beautifully pricked and exquisite shape of the ear; the conspicuous neatness of the leg below the knee; and the beautiful make of the hind quarters. The fleetest among them are also noted for a straight-dropped hind leg, which is always regarded as a good point. A true Arabian has been described as "looking the gentleman all over, with a bearing as stately as that of an autocrat."

In spirit he is as noble as in his physical formation. Though kind and docile when with his native master, he is sensitive and full of spirit, and when excited is so indomitable that he would run or pull to the death rather than yield. With a cruel master he is apt to become in a measure ungovernable; but his intelligence is such that proper treatment will soon win his confidence and remove a vicious habit.

His sagacity is as remarkable as his susceptibility to kind treatment. Instances are not wanting in which his master, overcome by the heat of the desert, and lost in a lethargic sleep, has been watched over by his faithful animal, and guarded from the approach of man and beast.

The colors mostly prevalent among them are bay, gray, and chestnut. Occasionally a black is found.

He is not so swift as the best English, French, and American coursers; nor is it here that his great excellence must be sought. That arises from a combination of qualities, to some of which the best of other breeds are wholly strangers.

He is peculiarly adapted to that waste and barren country, and to the uses for which he is prized by the wandering tribes. The food and drink upon which he can live and perform great journeys would be wholly inadequate to the keeping of one of ours which we are pleased to call thrifty.

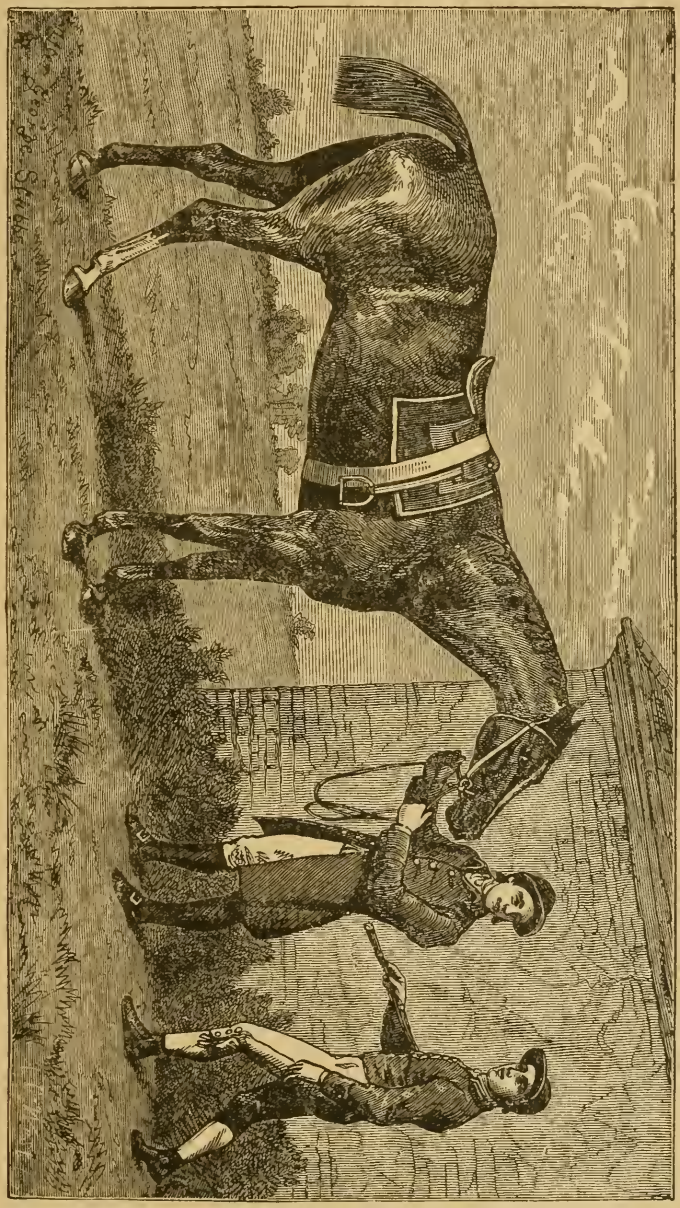
As has been said, this remarkable stock has long maintained its essential purity; nor does it show, in recent times, any tendency to degenerate. Those good Arabians that are offered for sale to British residents and other horse dealers in the markets of Bengal and Bombay command prices ranging from seven hundred and fifty to one thousand dollars; and it is said by travelers that their best mares are seldom if ever sold.

IV. The English Thorough-bred.

We have already referred to different varieties of English horses, some of which have had more or less influence upon those of our own country; but the most excellent and famous of all is the thorough-bred, or race-horse, descended chiefly from imported Arabians, Barbs, and Turks. The animal known to-day as the real English thorough-bred is perhaps of almost purely eastern origin. His excellences are derived, it is thought, from an admixture of various pure breeds, native to those regions to which the noblest of the race are indigenous, so far as either history or tradition determines. Arabia, Syria, Persia, Turkestan, Nubia, Abyssinia, and the Barbary States, all have breeds closely connected with each other, and yet possessing different characteristics; but the English race-horse is a superior animal to any of them; and his blood cannot now be improved by crossing with any known stock.

There seems to be in him a larger mixture of the Barb than of any other breed; but the earliest and most celebrated importations into England were Arabians. Much attention has long been paid there to the improvement of racing stock. The minds of Englishmen were most probably turned to this by the accession of the Norman Conquerors; at any rate, soon after the Normans were established in the island, the first Arabian of which any record has been preserved was imported. This was in 1121, during the reign of Henry I. Then, an authenticated case of importation from Arabia took place in the reign of James I. This horse was condemned, not having met the popular expectation; but the true value of eastern blood began now to be appreciated, and the White Turk was soon brought over; then a horse known as the Helmesley Turk; soon afterward, Fairfax's Morocco Barb. The interest in the improvement of racing stock then so actively manifested has never suffered more than a temporary abatement, and in no other country than in England has such success been attained. During the troublous times consequent upon the overthrow of Charles I. and the accession of the Puritans to

power, there seems to have been a decline; but a love of racing, and a corresponding desire to produce the best horses for this purpose, was



THE ENGLISH RACE HORSE, "ECLIPSE."

revived upon the restoration of Charles II. to the throne. This prince himself sent to the east to purchase brood mares and stallions, but he

affected chiefly Barbs and Turks. Many of his wealthier subjects engaged in like enterprise on their own private account.

But the most marked improvement of English stock followed the introduction into that country of the Darley Arabian, a fine and vigorous stallion imported during the latter part of Queen Anne's reign by one Mr. Darley. Several horses of great repute descended from him, of which the most noted were Almanzer, Flying Childers, and Bartlett's Childers; and from the Childers, besides numerous others, of more or less celebrity, Childers, Blaze, Samson, Snap, and Eclipse deserve special mention. Of the last named, it is recorded that though he was thick-winded or what is termed a "roarer," he never lost a race and never paid a forfeit; and that three hundred and thirty-four of his descendants proved to be winning horses.

During the reign of Louis XIV., of France, and when the Arabian stock, the descendants of the Darley, were already in high repute, a horse called the Godolphin Arabian, but which was really a beautiful Barb, of excellent spirit and action, was rescued by one Mr. Coke from the ignoble employment of drawing a cart in the streets of Paris, (where his striking characteristics seem to have been wholly overlooked), and carried to England. He is said to have been about fifteen hands high, of a brown color, and to have been distinguished by the height of his crest and for round and drooping quarters. From him is descended much of the finest racing blood in England.

We have spoken of the thorough-bred as a pure-blooded horse; and though this ought doubtless to be understood with some limitations, as even in the best of the stock there is probably some tinge of old English and Spanish blood; yet, such has been the great care bestowed upon him that he is regarded as "the eastern horse brought to the very highest state of perfection." It is certain that, as previously remarked, he is in some respects superior to the best of the original breeds. This has been brought about by long continued careful attention to breeding, to feeding, to all those points, in fact, necessary to the elimination of vicious strains and the preservation and improvement of those qualities that tend to the one great end in view—fleetness, with a corresponding power of endurance. The climate of England is said to be peculiarly favorable to the horse; and this influence has perhaps contributed something to the making of the English racer a pre-eminently fine and much admired animal. The following may be regarded as his distinguishing points:

His chest is his one and only mark of superior strength; this is wide and deep. His body is round, his flanks and belly light. His ears are fine; his eyes prominent; his nostrils are wide; his lips are small and thin, while he is remarkably wide between the jaws. He has a long and

fine neck, to which a thin mane lies close. His withers are uncommonly thin and high; his back is low at the withers, then straight to the haunches. Measured from the haunches to the turn of the rump, he is long; from the turn of the rump to the tip of the hock he is long and thin. He has great power of springing, to force himself forward, by reason of his legs standing rather under the body than erect. His buttocks rarely touch each other; his legs below the knee and hock are small, and the cords stand out conspicuously. His tail is slight and thin-haired, sometimes slightly waved; the hair of his legs is very fine; he has no fetlock tufts, and his hoof is small and cupped. His color is generally bay, brown, or chestnut; his height varies from fifteen to seventeen hands. His coat is thinner and the hair more silky than in common breeds.

The soundness of feet and legs, and the powers of endurance, which characterize the Arab, have been transmitted to the thorough-bred; and while the latter is not himself well suited to heavy harness work, or indeed to any of the general purposes of the farmer, animals are often obtained by judicious crosses with him which are admirably adapted to various uses. He is valued solely for the turf, and for light single draft, except, as we have before remarked, for the improvement of the general stock of horses by admixture; and for this latter purpose we are largely dependent upon him in America as well as in Great Britain.

V. The Barb.

The horse of the Barbary States has long been known for his excellent qualities; and he is especially remarkable for fine and graceful action. His powers of transmission are great, so that his marked traits are found in his descendants at remote periods and after commixture of various and inferior breeds.

He has impressed himself particularly upon the Spanish horse and the English racing stock. It is thought that the horses of Spain owe all their excellences to Barb blood, which was brought into that country by the Moors, at the time of the conquest.

The Barb is found chiefly in Morocco, Fez, and Tripoli, and with the exception of an excellent species found in the kingdom of Bournou, he is the only African horse deserving of special mention. The horse of Bournon is represented by some as being superior to both the Arabian and the Barb.

In addition to what has been said in those sections in which we have treated of the Arabian and the thorough-bred, the following description of the Barb will be sufficient to convey to the mind of the reader what a true horse of this breed really is:

In height, he is from fourteen to fifteen hands; his chest is round; his shoulders are broad, but light, and somewhat obliquely sloping; his withers are thin and rather high; his loins are straight and short; his flanks and ribs are round and well developed; his haunches are strong; his croup is somewhat too long for nice correspondence with the rest of the body; his quarters are muscular and full; his legs are clean, and the tendons are clearly marked; his pasterns, like his croup, are somewhat too long and slanting, but not so much so as to amount to real defect; and his feet are sound and of good shape. But his head is especially beautiful. It is small and lean, while the ears are of medium size and admirably placed. The mane is rather meager; but the neck rises boldly from the withers, and gives an impression of ease and grace in carriage.

In spirit and fleetness he is not regarded as the equal of the Arab much less of the real thorough-bred; but in a certain native vigor and in form he is superior.

VI. The Persian.

No traveler to whose writings we have access in this country has sufficiently described the horses of Persia to enable us to point out with exactness the difference between the inferior and the better breeds that are known to exist in that country. The term *the Persian horse* is ordinarily applied to the most excellent of all, which has been celebrated for hundreds of years longer than the Arabian. At the present day, he has a large proportion of Arab blood in his veins. As a general thing, he is somewhat taller than the Arabians; and in beauty and speed he is their equal; but his powers of endurance are not so great.

VII. The Turkish.

This horse is believed to be descended from the best stock of Arabs, crossed, however, with some breed that has given him greater proportions than his ancestors; at any rate, the Turkish horse of to-day is full sixteen hands high, often more; and he is more muscular than the Arab, though still of elegant appearance, clean limbed and active. It is asserted by some that he is descended from Arabs and Persians; and it is known that he possesses many of the best qualities of these stocks. Though strong and of sufficient spirit, he is docile, and well adapted to domestic uses.

An arched neck, with a high crest, is a striking characteristic of the breed.

VIII. The Turkoman.

As we have said elsewhere, none of the Tartar breeds except the Turko-

man or South Tartary horse are worthy to be rated among the better class of animals. He is famous for purity of blood, for good speed, and for wonderful powers of endurance. It is related that one of them has been known to travel nine hundred miles, bearing a rider, in eleven successive days. He is not really a graceful animal, however, as his head is rather large, and his legs are long in proportion to his height, which is from fifteen to sixteen hands.

Other domesticated horses among the Tartars are evidently of the same breed as the wild horses which are found in various parts of the country and in immense numbers, as the characteristics of the wild are exhibited in a marked manner in the domesticated. Indeed, it is known that these wild herds are often drawn upon for recruits when necessity drives the inhabitants to add to their stock of serviceable animals.

All these inferior creatures are small and narrow; they have long necks, apparently weak legs, large heads, and light barrels. The prevailing color is a reddish sorrel, with a black stripe along the back. Their manes and tails are black, except at the roots, where the hairs preserve this reddish cast. Their general appearance is rough and inelegant: but they are of the most hardy nature; and, contrary to appearance, they are rapid travelers. They live and even perform long and arduous journeys upon the sparsest and poorest food.

IX. The Egyptian.

It is represented by some who have devoted more than ordinary care to the study of the origin of breeds, and to the horse in his relations to various peoples and countries, that the horse of the ancient Egyptians was identical with an inferior race that afterward existed among the Assyrians. Some sculptures, found among the ruins of Nineveh, carefully executed and well preserved, portray a horse wholly different from that nobler animal carved in other bas-reliefs found in the same ruins. He is said to have been the Egyptian horse; and as thus conveyed to us, he was a large and heavy animal, having a coarse and ill-proportioned head, but a high crest.

The modern Egyptian is also of unpleasing aspect. From wheresoever derived, he is rough and ugly. Frequently his legs, knees and neck become positive defects; but a good head is occasionally found. He would scarcely be deserving of mention were it not that he is spirited and impetuous; and this, together with his weight, renders him valuable for heavy cavalry, in which capacity he has won some celebrity. His powers of endurance are not great.

X. The Dongola.

This horse is also entitled to consideration chiefly upon the ground of

his being greatly prized as a war horse. Unlike the Egyptian, however, he has not only speed but powers of endurance; and some have described him as both beautiful and tractable. Yet, even those who have had opportunities for personal observation do not agree in their descriptions and their estimates. One speaks of him as being deficient in substance and wanting in stoutnesss; while another thinks him to possess the highest type of symmetry, size, and strength. From another we get this more particular description: In height, he is full sixteen hands; his body is short; his neck is long and slim; he has a fine crest; and his withers are high and sharp; but his breast is narrow, his quarters and flanks are flat, and he has a rather ugly back.

He is found in the kingdom of Dongola and in adjacent regions.

XI. Wild Horse of America.

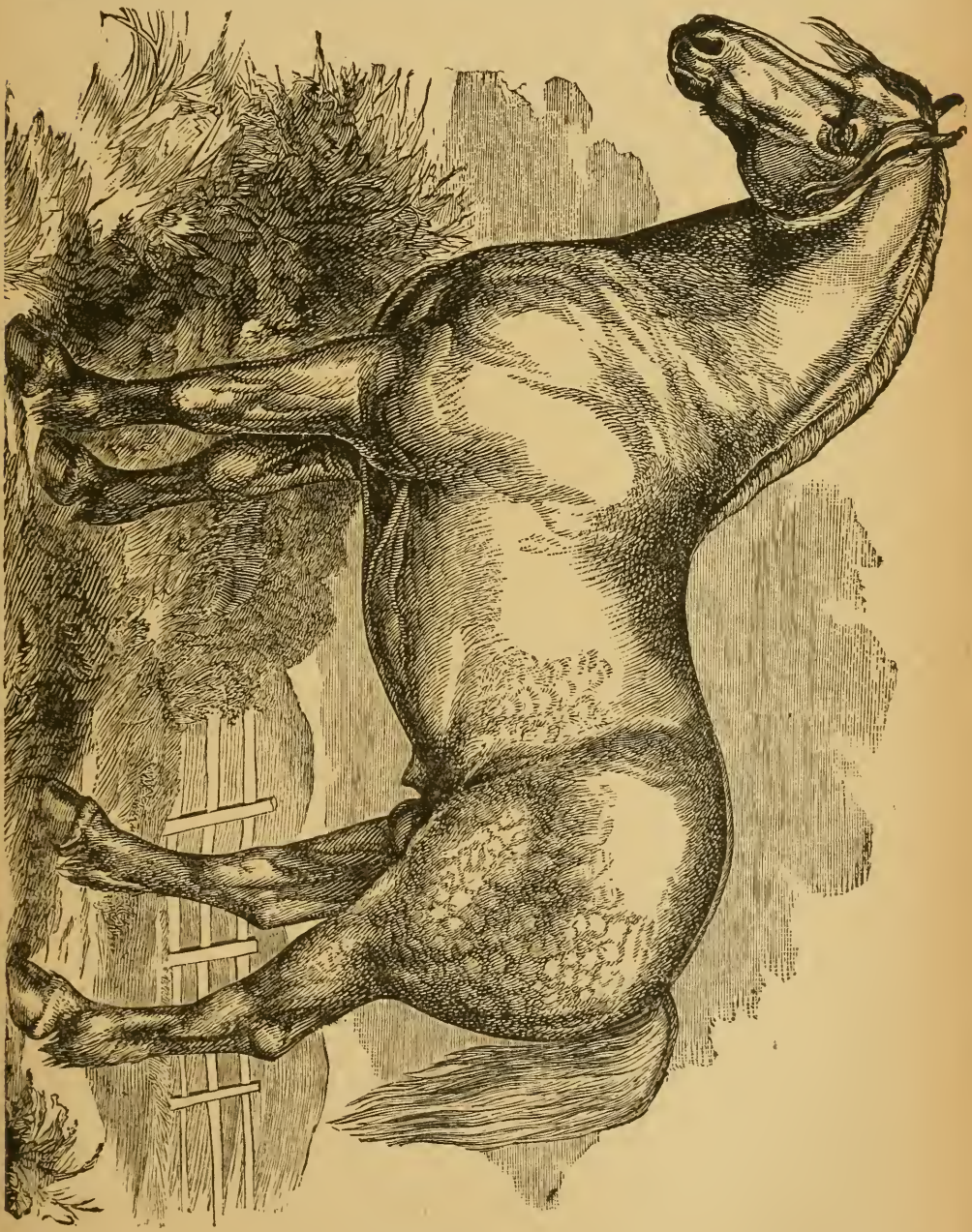
That the horse existed in America at some far distant epoch is undeniable since the fossil remains found prove this conclusively, and progressing naturally from age to age into more and more perfectly developed types. Yet at the discovery of America at the several points by the early navigators, no mention is made of native horses, as would surely have been done if such had been known to the Indians.

America is undoubtedly indebted for her wild or feral horses which have roamed the great valleys of the Pacific slope, the immense plains of the West and South-west, and the grassy portions of Mexico, to the early Spanish adventurers on the Pacific slope, as were the wild horses of the great plains and of Texas to the horses abandoned by De Soto when he turned his face eastward towards the Mississippi, after having abandoned his search for the fountain of youth and the new Eldorado. So Mexico and the Isthmus were stocked with horses in like manner, for it is futile to suppose that the increase of horses escaping from the Spanish conquerors of South America would have made their way northward through interminable and tangled forests, and mountain fastnesses, but that rather they would have betaken them to the pampas, which in reality they did. Thus in a comparatively short time they covered most areas of country with immense droves, in reality as wild and as free as though they had always existed there.

That the facts are as we have stated, is patent from the fact that the produce resembles in many close characteristics the Spanish and Andalusian horses of the early Spanish adventurers, as did those found wild in New Foundland resemble the French horse of that period; as does the Canadian pony of the present day, although diminished in size from insufficient food and the inclemencies of the climate through the long generations which have passed since their introduction into Acadia in 1604, and into Canada four years later.

XII. The Norman Percheron.

Among the striking and useful breeds, no horse has attracted more attention during the last half-century than the Norman Percheron, other-



NORMAN PERCHERON STALLION

wise known simply as the Percheron,—a stock peculiar to La Perche, a

district in France. Volumes have been written respecting this horse, and various theories as to his origin and development have been advanced, by interested partizans at times, and again by pure lovers of horses who pursued truth for truth's sake alone.

One writer insists that he is descended from what some call the primitive or natural horse, the pure blood Arabian, crossed with a stock of heavy draft horses existing in that section, but without historic mention, prior to the Crusades. He thinks that after the defeat of the Saracen chief, Abderame, by Charles Martel, in Vouille, in which battle a host of Saracens perished, the cavalry of the enemy, Oriental horses of marked character, true Arabs, fell into the hands of the French,—thence many of these horses were brought by their victorious masters to the districts of Normandy and La Perche. Here commixture of blood with a heavier horse of excellent quality followed, and the cross resulted in producing the now celebrated Percheron.

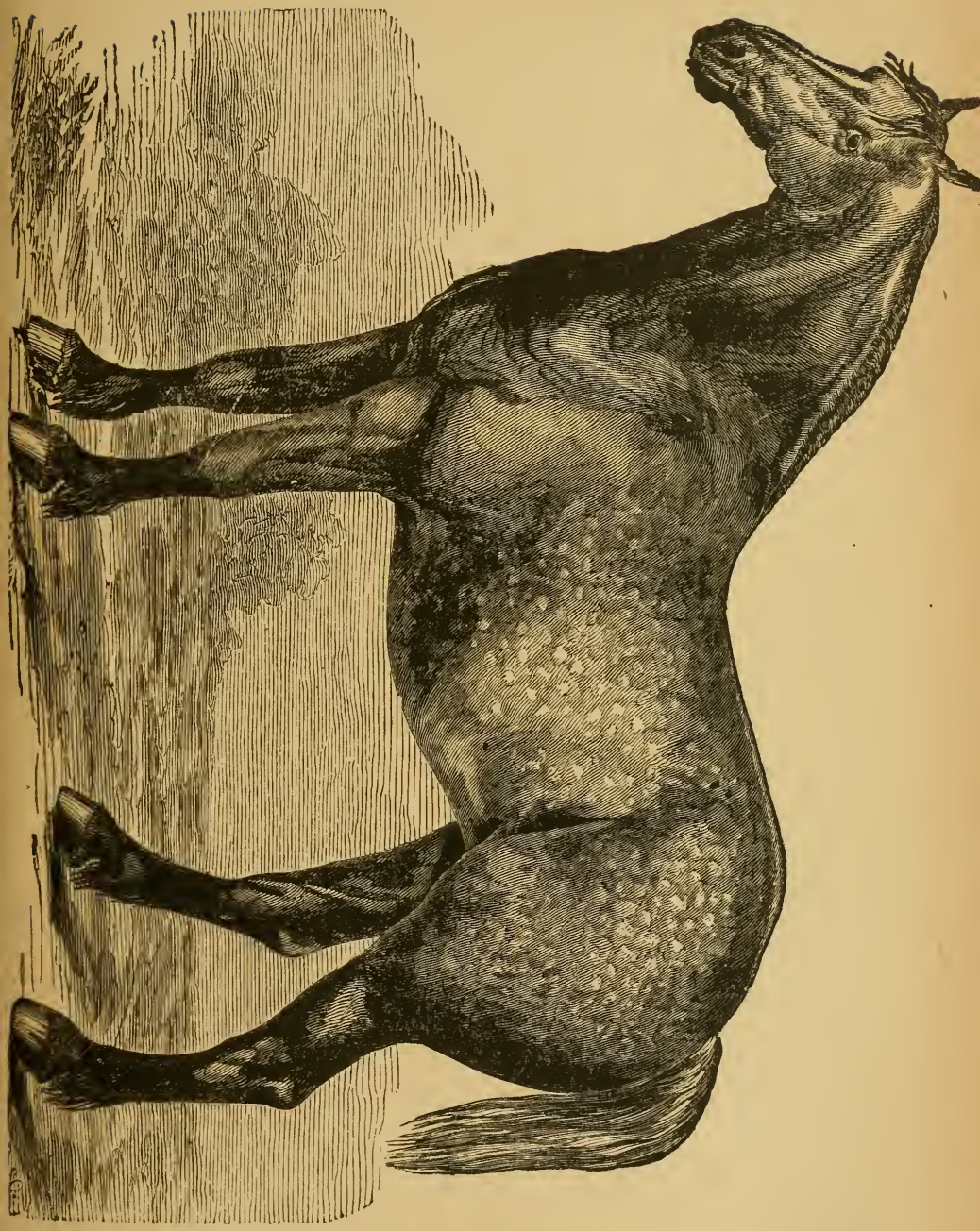
The native race referred to is thought by some to have been the old war horse of the Normans—heavy, bony and slow—good for cavalry use during the days of chivalry, when the carrying of a knight and his armor required an animal of great strength and powers of endurance.

Others think that it was a stock of horses then peculiar to Brittany and used for draft rather than for war.

One author asserts that the Percheron is descended from a remote cross between the Andalusians (after their commixture with the Morocco Barbs) and the Normans; and this somewhat fanciful reason is given for the active agency of man in bringing it about: that the Norman, though powerful, was too slow for a fully caparisoned knight—the Andalusian or Spanish Barb was too light—and a cross was effected for the purpose of securing a horse that combined speed with power.

But it is not within the scope of the present work to enter into minute particulars of this kind, nor to indulge in the discussion of mooted points that have a merely curious interest.

Whatever may have been the origin of the Percheron, it is evidently a pure race, one capable of producing and reproducing itself unchanged through a long succession of years, and without deterioration of qualities when like sires are bred to like dams. Even when the Percheron stallion is put to the service of inferior mares, he impresses himself in a remarkable manner upon his offspring, transmitting to them his own striking characteristics. Percheron mares bred to inferior stallions affect in like manner, and in almost equal intensity, their progeny—though the rule is that the stallion exerts the greater influence in determining the character of the foal.



The old Norman stock is said to have transmitted to this race their extraordinary bone and muscle, while the Arab or Andalusian or whatever may have been the cross, give the spirit and action. The Norman has

been described as being capable of carrying great burdens at a reasonable rate of speed; to have been large, compact, muscular, and possessing the greatest endurance.

The points of the Percheron may be stated as follows:

The head is short; the brow is broad, and has that hollow of profile between the eyes and nostrils sometimes known as the dish-face—(in this greatly resembling the Arab); but the head in general is not heavier than seems in keeping with the general massiveness of the frame; the neck is long, well-arched and heavy, but, like the head, not disproportioned to the general bulk. The back is short; they are well ribbed up and round barrelled; their legs are particularly short from the knees and hocks downward; they are heavily haired, but have not such shaggy fetlocks and feet as this would seem to indicate; their sinews are iron-like; and their feet are hard, sound, apparently insensible to disease. In height, they are from fourteen and a half to fifteen and a half hands, the latter being rather more than the average. Gray is the characteristic, almost the only, color.

For hard work on ordinary fare the Percheron is unequalled; and his energy and endurance are wonderful. He will keep his condition where another horse would die of hard labor and neglect. Though full of spirit, unflinching under even painful effort, he is yet docile.

In mere speed he is by no means the equal of the thorough-bred; but for quickness of movement at heavy draft he has no rival. Hitched to a light carriage or wagon he is capable of maintaining a good rate of speed for a long time together, or of making comparatively short journeys with a rapidity that is astonishing. One, carrying a light vehicle and the driver, is known to have made 55 3-5 miles over a hilly and difficult road, in four hours and twenty-four minutes; and another, harnessed in like manner, is said to have traveled 58 miles and back in two consecutive days, without being touched with the whip, occupying four hours and less than two minutes going, and four hours, one and a half minutes returning.

The Percheron of to-day makes an excellent cross with either the Arab or the English thorough-bred. For the improvement of our draft stock in the United States, no other horse is to be compared to him. Bred to good mares, this half-breed would partake more of the qualities of the sire than of the dam, and the progeny would be almost the equals of the pure French horses. Another step, bringing a pure imported stallion to the service of these half-breeds, would give us a race of horses for all work that would so far excel the ordinary race of scrubs as to seem almost like a different species of animal.

At Oaklawn, Du Page Co., Ill., is one of the largest stud farms of the world, and it is devoted exclusively to the Percheron stock.

XIII. The Clydesdale Horse.

The west of Scotland has been long famous for its draught horses. Away in the upper ward of Lanarkshire, the progenitors of that noble race of horses so called Clydesdale, from the Vale in which they were originally reared, were first brought to the front and made famous throughout the whole of Scotland; so much so that the common work horse of that country is now, to all intents and purposes, a Clyde; and many of the Shire Horses of England are deep in their blood also.

Where the originals came from, and how they were bred, are questions that have often been discussed in the public press. Tradition, without any foundation in facts, points to the importation of Flemish Stallions into the above ward nearly two centuries ago, by one of the Dukes of Hamilton, who sought improvement in his stock.

Whether such is the case or not, certain it is that by some means or other, the farmers in that country possessed a grand lot of brood mares, from which the Clydesdales of the present day owe their activity and hardiness. Our own opinion is, that they grew up into the state of perfection in which they were found about the beginning of the last century, through the judicious mating of the home stock, and that up to that time, little or no fresh blood was introduced.

The upper ward of Lanarkshire is a wild and somewhat bare country, with a thin soil, which, however, is admirably adapted for grazing purposes; the farms are small, and the husbandmen who made their livelihood from the profits of the soil, were a shrewd and saving race, with a love for their stock born in them. Proud of their cattle and horses, and considerably skilled in their care, they developed for the district in which they lived, a class specially suited to their wants.

In kine they modelled, as it were, the Ayrshire Cow, and in horses, more especially in this particular district, they produced and kept continually improving the Clyde. Just as on the banks of the Tees, long years ago, there existed a grand race of cattle, so on the hills that rise gently away from the waters of the Clyde, a class of horses belonged to it, which were associated with no other shire or county in Great Britain, till a more enlightened day with the aid of the printing press spread their fame abroad, and created for them an immense demand.

Thus we find the horses about the year 1720, when Mr. John Paterson, of Lochlyoch, introduced a Flemish Stallion.

Whether through the introduction of this horse or otherwise, the Lochlyoch mares became very famous, and from them, directly or indirectly, most of the noted stock of the present day trace their origin.

From the Lampits mare, a descendant of the above stock, came Glancer (335), the horse that may be called the father of the present race of Clydesdales.

In a table compiled for the "Clydesdale Horse Society" it is astonishing to see the influence that this horse has wielded. Without any system, most of the breeders were ignorant that such a horse ever existed, till the herculean labors of Mr. Dykes, secretary to the above society, ferreted out all these facts.

It is most interesting to study the relationships of the various crack horses of the present day.

Wherever you begin, the pedigree by some means runs into Glancer (335).

Gradually, but surely, from those wild uplands, Clydesdales have spread, as it were, over the whole world.

They found, early in this century, a congenial home amid the richer soils of Galloway, and while thriving there, they obtained even a greater notoriety on the bare hillsides of Kintyre.

Branching out thus, they spread over all Scotland, reaching some favored spots in England, and within later years they have found their way to America and Australia, where they are as much prized as upon their native heath.

In the Antipodes, they have no rival, but in the United States they come into competition with the "Percherons."

The inherent value of the Clydesdale lies in his reproducing powers. Bred for generations among themselves, ofttimes bred *in and in*, they are most impressive, and put upon the common mares of this continent, the produce is a splendid farmer's horse, while those animals which have two or three crosses of this blood, are becoming exceedingly valuable for draying in towns, and, owing to their special fitness for heavy work, at the present moment the demand far exceeds the supply.

The indications are, that the Clydesdales and Percherons will gradually become the work horses of America.

Farmers who in olden times (and, we are sorry to say, even in these days), merely scratch their land, have no use for either of those breeds, but as agriculture advances, as science surely overcomes brute force, when the days of deep ploughing and thorough cultivation become a necessity, then will the husbandman know the value of heavy, well-built horses.

To attain this end, horses of the above breeds must be used. Each will serve their end, but for wear and tear it is likely the Clydes will eventually take the lead.

It is true, the Clydesdales of the present day are not so hardy as they were. The system of feeding for show, carried to great excess by the Scotch breeders, has given rise to diseases among pure-bred animals, which they do not happily reproduce, and which has tended to make some of the best horses that ever were bred, but indifferent stock-getters.

Then little attention was paid to systematic breeding. The old way and style which, no doubt, was conducted with great success as far as it went, did not tend to produce so many good horses as we may expect under the skilful mating of both well-bred and good-looking animals.

"YOUNG WELLINGTON,"

A CELEBRATED IMPORTED CLYDESDALE STALLION.

Property of POWELL BROTHERS, "Shadeland," Springboro, Crawford Co., Pa.

Just as we have seen grade bulls vie in excellency with the thoroughbred, so it was with the Clydesdale horse. Five years ago, through the efforts of various parties, all lovers of the Clyde, a society was established for registering pedigrees, and their operations have met with signal success.

They have laid the foundation of a system by which breeders can attain grand results from a careful and judicious selection of good blood. And so in America they have a *Stud Book*, drawn up on the same basis as the Scotch publication, and here breeding is being carried on, more especially by Western breeders, with a zest second only to that of the farmers in Scotland.

This American and Colonial demand for good horses with pedigrees, has given a great impetus to breeding at home, and it is likely we shall see some grand results from the efforts that are being made. Blessed with perseverance, and holding their own judgment at a premium, no men are better suited for this work than the small dairy farmers from the regions of Ayrshire, Galloway and Lanarkshire.

It is to them and some larger farmers and proprietors we need to look for the grand colossal horses which have made, and are destined to make, the name of the Clydesdale more famous than ever.

The main feature of the Clydesdale is its size, combined with activity and hardiness. Bred upon a bare, and not very prolific soil, they thrive well upon being transplanted to a more generous and richer location. It is the universal practice among the west of Scotland breeders to keep their young stock in a semi-wild state, giving them only as much food as is necessary for health and development until they are between two and three years old. Great capacity for endurance is thus secured.

A fat colt is never seen, scarce even among those reserved for the stud. Treated thus when they are young, they grow up hardy, with clean bones and well-developed muscles, and almost entirely free from hereditary disease. And, perchance, no horse of the present day, excepting those existing on the Arabian deserts, can compare for genuine and valuable intelligence with those we are now writing about.

Treated for generations by their masters as companions, that is, after they had received their primary education, a sense almost human in some cases is found engraved in their nature.

Just as the Scottish Collie and the noble Newfoundland have developed almost supernatural instincts, so the Clydesdale horses, being the companions as well as slaves of a class of men who took pride in their sagacity, have come to be looked on as possessing a rarely and widely defined instinct. Thus they combine strength, soundness and sense, the three attributes necessary to make a horse successful in the wagon or plough.

THE POINTS OF THE CLYDESDALE.

The writer had much to do with the formation of the Clydesdale Stud Book,

and for a full description and history of the breed of horses we refer our readers to this volume.

In the meantime we cannot do better than abridge as shortly as possible the beau ideal of the horse as given there:

The head, a broad jaw, ending, as a rule, in a not very fine or well-developed muzzle, but with large, open nostrils.

The eye full and vigorous, yet mild.

The forehead broad and full, especially between the eyes.

The ears long and active.

The neck should be strong and massive, supporting the head gaily, and showing on its top a good development of muscle.

The shoulder should be oblique, like a thoroughbred, so that the horse can step out boldly.

The legs should be short from the fetlock to the knee, and comparatively long from the knee upwards.

The forearm should be well developed, showing lots of muscle.

The bones must be hard and flinty, flat-shaped, with no fleshiness; both muscle and bone seeming entirely separate. Lots of hair is essential. Of little use itself, it shows forth quality and strength of bone, and is typical of the pure-bred horse.

The knees should be big and bony.

The feet of the Clydesdale are nearly invariably good; great, big, widely developed hoofs of the best quality, and connected with the leg with sloping pasterns, which help every horse to go up and down hill. Nothing, in our idea, is so essential to a draught horse as good pasterns.

The chest should be broad and full.

The back and barrel should be straight and round, with the ribs going well back towards the quarters. In this particular we find the weak part of the Clydesdale. He is not altogether so symmetrical as he should be, as a rule, in this respect.

Broad, low-set quarters, with muscular thighs descending into broad and proportionately-developed hocks, sum up the good points of the hind end of the Clydesdale. Avoid fleshy hocks; let them be clean cut and devoid of fat or puffing.

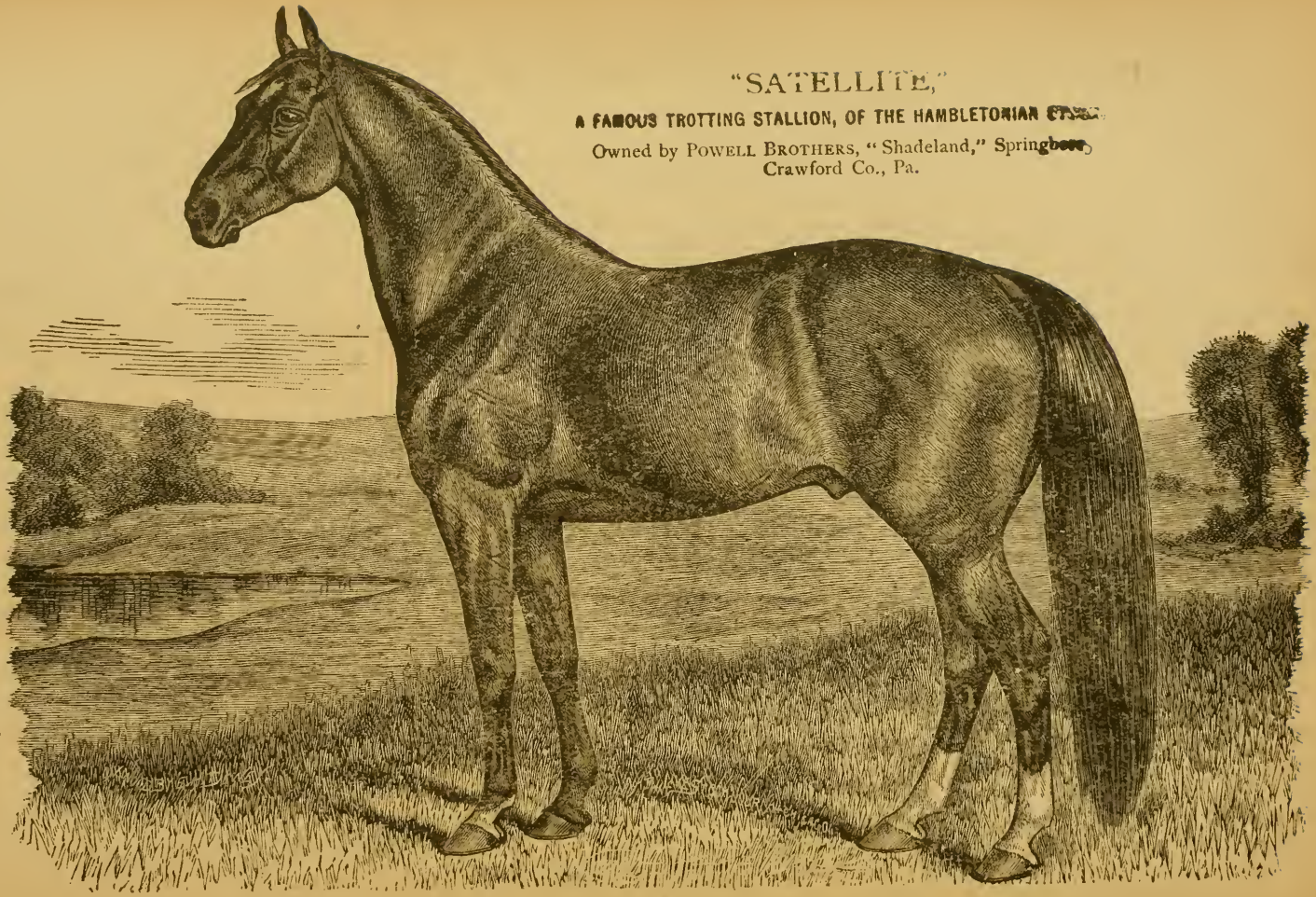
The hind leg should be short, broad, flat, clean and slightly inclined forward, while the pastern should also incline forwards ere it joins the hoof.

The height of the Clydesdale averages about sixteen hands two inches; over that height they become clumsy, except when very well developed.

The best color undoubtedly is brown, with white marks, and, so far as possible, this color is being adopted among breeders.

Good action is sure to be possessed by a horse modeled on the above type.

Both walking and trotting, there will be a style and majesty that attracts the eye and is useful when at work.



"SATELLITE,"

A FAMOUS TROTTING STALLION, OF THE HAMBLETONIAN STRAIN.

Owned by POWELL BROTHERS, "Shadeland," Springboro, Crawford Co., Pa.

XIV. The Thorough-bred in America.

The Flemish and Danish horses, large, strong, heavy draft breeds, have had more or less influence upon the horses of the United States, particularly in Pennsylvania, Ohio, and the northwestern States; but no other blood is so widely disseminated among our various stocks as that of the English thorough-bred. We have been dependent chiefly upon this animal for the improvement of the horses among us; and from a time long prior to the Revolution, it has been the custom of our most ambitious breeders to import from England both stallions and mares, but more especially the former, for this purpose.

Leonard Calvert, Lord Baltimore, sometime between 1740 and 1750, presented to a Mr. Ogle an English thorough-bred stallion, by which the colonial horse of that portion of the country was much improved; and this same gentleman, Ogle, imported Queen Mab, shortly after he came in possession of "Spark," the Baltimore horse. Selima, a mare sired by the Godolphin Arabian, was brought over by one Col. Trasker; Miss Colville, or Wilkes' Old Hautboy Mare, was imported by Col. Colville; Jennie Cameron, Crab, and others, by different persons, at various times.

It was not until within about fifty years ago that any reliable stud book or turf register began to be kept in the United States; so that it is often difficult to establish a claim to good pedigree extending beyond that time; but many valuable importations are known to have taken place previous to 1829; and the register since kept shows that there is a very large admixture of English blood in many parts of the country.

The work stock of the southern States before the war, as now, was, of course, drawn mostly from States farther north and east, and was of indifferent character; but much attention was paid in that part of the country to raising stock; and all horses raised there have more or less of the thorough-bred in them. Many really fine animals were found there, —the race-horse preserved in his purity,—but the true thorough-bred has rarely been found at any time in the northern States. In New England, the good driving horse, the horse of all work, medium sized and stoutly-built, is mostly found; in New York, they have animals representing almost every variety of breed known in the United States, and among them the descendants of many famous racers.

In Pennsylvania, Ohio, and the Northwest generally, they have a great variety of heavy draft horses—some of them of great size—not much attention having been paid, as yet, to saddle, light carriage, and race horses. In the West however, considerable improvement has been made by the introduction of fine stallions from Kentucky and Tennessee, of both the thorough-bred and the Morgan strain. In Kentucky and Tennessee, the breeds are various, but there is a very large admixture of the

thorough-bred. Their saddle, light carriage, trotting and racing stock are justly renowned. Scarcely any country in the world is better adapted to the production of fine horses than the blue-grass region of Kentucky; and it constitutes a sort of Arabia of the West, to whose breeders and trainers the buyers of the United States, sometimes even foreign gentlemen, come to purchase mares, stallions, and trained coursers.

The American thorough-bred retains many of the striking characteristics of the Arabian and his best old world representative, the English racer; and in speed he compares well with the best horses of England. He is more stoutly built, however, and capable of more endurance than the English horse.

XV. The Morgan Horse.

A story is current to the effect that during the war of the Revolution, one of the British officers, Gen. DeLancy, rode a very beautiful stallion, of great value—said to have been a true thorough-bred. This horse was stolen by one Smith, an American, and retained within the American lines. He was the sire of a colt from a Wild Air mare; and the colt, being foaled or having become by purchase the property of one Justin Morgan, of Randolph, Vermont, received the name of his master, and his descendants have ever since been known as the Morgan horse.

The stolen stallion, called "The True Briton" or "Beautiful Bay," has been described as not only beautiful, but as having possessed great action, and being capable of leaping fences, hedges, and ditches, bearing a rider, from which it has been argued that he was not a thorough-bred, since that stock cannot jump; but he was in any event a remarkable horse, and his valuable qualities have been transmitted to his descendants. Of so pure blood and marked character was he that his powers of reproducing himself equalled those of the most unmistakable Arabian; and the Morgan blood is perceptible after various crosses, and that too, with many inferior breeds.

So marked are the characteristics of these horses, and so different are they, in some particulars, from other races, that they seem fully entitled to be considered a distinct breed. They are in great repute, also, in many portions of the country; and some efforts have been made with much success, to bring the stock back to its former and better condition, by breeding from the best and most strongly marked stallions and mares.

They are stout and hardy, while at the same time of good form—capable of performing the greatest amount of labor, and that, too, with quickness of movement. They are always in demand, and command the highest market prices.

The following are the distinguishing points of a true Morgan:

In height he is from fourteen to sixteen hands; in weight sufficiently heavy for this height, with no appearance whatever of coarse bulkiness. He is compactly built, and of great strength; his action is fine, his endurance unsurpassed, and in spirit he is indomitable—never failing at a pull, if rightly handled—yet patient and trustworthy. As roadsters and horses of all work they are excellent—having no equals, perhaps, in this country. He walks fast, and many horses of this breed have been extraordinary trotters. In harness he is quiet, but nimble, and of eager movement. Bay, chestnut, and black are the prevailing colors. The mane and tail are rather heavy and coarse, and in general wavy.

The head is not extremely small, but there is no superfluous muscle or fatty matter about it; the face is straight, the forehead broad, the ears are small, fine, and set far apart, the nostrils are wide, the lips are close and firm, the muzzle is small, the eyes are not large, but very dark, prominent, set wide apart, and full of animation. The back is short; the shoulder-blades and hip-bones are large and oblique, the loins broad and muscular; the body is long, round, deep, and closely ribbed up; the chest-bone is prominent, the chest wide and deep, the legs seem rather short for the height, but they are close-jointed, and though thin, they are very wide, hard, clean, and yet with powerful muscles; the feet are small and round; the hair is short and flossy at almost all seasons; the fetlocks are moderately long, and there is some long hair up the backs of the legs.

In some parts of the country the Morgans are the premium horses, and their peculiar adaptability to all the ordinary purposes of the farmer is such that they enjoy a high degree of favor.

As a breed, they are unusually long-lived, and this constitutes one of their great points of excellence.

XVI. The Narragansett Pacer.

This breed, now almost unknown as a distinct one, was remarkable chiefly as being natural pacers, and of such peculiar action as to render them peculiarly easy under the saddle. Though small, they were hardy and full of power, and their docility was such as to render them very pleasant to handle. The stock are said to have been imported into New England, from Andalusia, by one Gov. Robinson, and to have been bred chiefly in Rhode Island, where they were long held in great repute. Good saddle horses were in much demand in Cuba, and prior to the time when the Narragansett Pacer began to attract attention, the Cubans had been dependent for their horses upon the mother country. But the voyage was long, the risk considerable, and the cost great, and when it was once ascertained that a superior saddle animal, (according to the taste of

the times), could be had in Rhode Island, much nearer home, a trade was at once opened, which continued, with much profit to the Rhode Island breeders, till the roadways of the West Indies became so much improved as to render the introduction of light carriages a natural consequence. A somewhat different horse was then required, and the trade in American stock began to decline. As the Cuban market became less and less profitable, the interest of the stock-owners experienced a corresponding decrease, till at last the effort to preserve the pacer as a distinct breed ceased altogether.

At the present day, though the influence of the Narragansett Pacer upon New England horses is in many instances perceptible, he is no longer known in his former purity.

XVII. The Vermont Draft Horse.

Vermont has given the United States one of the two celebrated families of draft horses, than which few of the breeds have combined greater excellence. Animals with lofty crests, thin withers, short backed, round barrelled, close ribbed, clean and sinewy limbed, that would at first be taken for ponies. Standing next to them they would be found to be sixteen hands high and over, and on the scales they would tilt the lever at from 1150 to 1250 pounds.

Of the origin of the Vermont draft horse but little is known, but it is more than probable that the old Suffolk cart horse, imported into Massachusetts in 1821, the Cleveland bay, brought there in 1825, and the thorough-bred horses introduced in 1828, bred upon the best common mares of the country, have produced a class of horses, the lighter ones of which were driven to the stage coaches of thirty to fifty years ago, as they have seldom been driven in any other hill country.

And this class was grand for heavy work. The heavier specimens of which furnished the best heavy team horses in the country, not excepting the Conestoga, a horse fully a hand higher, and admirable in every respect for heavy draft, as we used to see them, in the great six and seven horse teams coming from the mountains of Pennsylvania through to New York. It is to be regretted that the furor over the Morgans since that time has caused the Vermont draft horse to become quite rare, so that now it is rather difficult to find a good specimen of the breed as it once existed.

The disappearance of these fine old horses, however, is of a piece with the disappearance of many other relics of the good old times. We think fondly of what once prevailed, and it seems as though nothing ever could be so good again, but those who never knew our favorites seem quite content, and get on full as well as though our pet things never had existence. Thus the essential things of one age sink from sight in another.

XVIII. The Canadian.

This horse, when pure, is entitled to be considered distinct. He can lay no claim, of course, to being regarded as the natural horse, no more than the Norman, Percheron or the English thorough-bred; but his characteristics are so marked as to render him worthy of being classed separately and noticed with some minuteness.

He is supposed to be descended from the Norman-French horse, brought over by the pioneers of Canada; but how crossed, (though he is evidently the result of a cross), it is impossible to say. In some particulars, he so much resembles the old horse of Normandy as to seem the unmistakable descendant of that stock; whereas in others he is so unlike him as to indicate that the cross must have been with a very strongly marked animal, of great powers of transmission.

The distinguishing characteristics may be stated as follows: The average height is about fourteen hands; the body is solid, compactly put together, but somewhat inclined to flatness of side; the head is rather large for a horse of the height stated, but it is well formed and lean, so that it does not appear out of proportion and cumbersome; the forehead is broad; the ears are wide apart, and carried well up; the eye is small and clear, and has a bold expression; the chest is broad and full; the shoulder is strong, but inclining to be straight and rather low and heavy at the withers; the loins are fine; the croup round and fleshy; the thighs muscular; the legs comparatively heavy and joints pretty large, but the bones are flat, and no race of horses has sounder and more powerful limbs; and none can equal the Canadian as to feet—these being tough, hard, iron-like, and free from disease, even under the most unfavorable circumstances. This seems to be one of his most valuable characteristics of body. Bad handling, awkward shoeing, hard travel—nothing in the bounds of reason seems to affect his feet. Diseases of this part are almost absolutely unknown.

The mane and tail are peculiar, being very heavy, and in almost all cases, wavy. The back sinews are shaggy-coated, nearly to the knee, and the fetlocks are long.

The prevailing color is black; but browns and chestnuts are frequently found; sometimes sorrels and duns, having manes and tails lighter than the body. Occasionally there may be found a dark iron-gray, with black legs.

Canadians are long-lived, easily-kept, and capable of the greatest endurance. They are heavy enough for the purposes of the farmer; and as roadsters, while they are not to be regarded as rapid travelers, they maintain a reasonable rate of speed, say six miles an hour, for long jour-

neys and continuously, and this while carrying a heavy weight. It is nothing uncommon for them to do fifty miles a day for many days in succession; and some have been known to do seventy, eighty, even ninety miles, at a single stretch of one day.

The breed is widely spread, but chiefly in a mixed state, (inferior to the true Canadian in almost every instance), in the Northern and Eastern States. Few horses are entitled to more consideration at the hands of those who would obtain the best medium-sized and easily-kept animals for the farm, and for medium heavy and moderately rapid draft.

XIX. The Connestoga.

A somewhat peculiar horse of all-work, said to have originated as a distinct stock in the valley of Connestoga. They are believed to be descended from Flemish and Danish cart-horses brought over by the early German settlers of this part of the country, with a probable admixture of the ordinary draft horse in common use in the German States at that day. There is, however, no record of the origin of the breed, and all speculation may be at fault. They resemble for the most part the Flemish horse, especially in color, all the prevailing Flemish colors except black being found among them in like proportion.

The Connestoga is a tall horse, often seventeen hands high; but his limbs are light for his height, and he is not inclined to be full of flesh, having a muscular rather than a fatty heaviness, so that he is very powerful in proportion to his weight. He is used chiefly for wagons, canal boats, and heavy carriages, for which purposes he is both strong and quick enough.

He is less distinct than formerly, and no pains are taken to preserve the breed as such.

XX. Ponies.

The small, or pony breeds, are numerous; but the only ones deserving special mention are the Shetlands, the Indian, and the Mexican Mustang. The former is the most distinct and best type of the ponies of the Old World, while the Indian and the Mustang are the chief, if not the only native kinds, known among us.

There are ponies somewhat similar to the Shetlands in the northern parts of Sweden and of Iceland, in Wales, and on the southwestern coast of England. All these little animals seem to have originated in latitudes to which the horse is not native, and to be dwarfed descendants of large and powerful progenitors.

Noticing first the *Shetlands*, those of most perfect form, though of

small size, are found in the extreme northern isles of Yell and Unst. In height, they do not average more than nine or ten hands; and many

SHETLAND PONIES

are found that do no exceed seven and a half. It is held that no true Shetland can be so tall as eleven hands. In form they are round and

closely ribbed up; the head is well shaped — lean and bony, wide in the brow, sometimes slightly basin-faced, like the Arab; the ears are very small, well placed, are carried erect; the eyes are large and bright, with a fine look of intelligence; the neck is short and thick, and covered with a great mass of coarse mane; the shoulder is sloping, thick, and having little elevation at the withers; the loins are broad but finely formed; the quarters are well made, but not large in proportion to other parts; the back is gently curving, with never any tendency towards what is called sway-back; the legs and feet are of excellent shape, and of the most powerful texture, so that the Shetlander is a stranger to all those diseases of the feet and legs to which many horses are subject, and a lame Shetland is almost unknown; the tail, like the mane, is of great volume.

When roaming wild they live on the poorest fare, and are exposed to all the inclemencies of the seasons. When they cannot pick up their scanty subsistence upon the uplands, by reason of the snows of winter, they betake themselves to the sea shore and live upon kelp and sea weed. When taken by the peasants of those localities which they most inhabit, and reduced to subjection, they still require but little food and little care.

Their endurance is very great; and though they are of course incapable of great speed, they will carry weights largely disproportioned to their size, and keep up a uniform pace of from four to five miles an hour throughout the day, accomplishing forty, even fifty miles between morning and evening with apparent ease.

They are gentle, affectionate, easily trained, and as children's horses, and for all other purposes for which a pony can be at all serviceable, they are the best of all found in either hemisphere.

The prevailing colors are black, brown, and a dark sorrel.

The *Mexican Mustang*, one of the most widely known and distinct of American ponies, is found chiefly on the prairies of Texas and Mexico. His origin is doubtful; though it is affirmed that notwithstanding his diminutive size, and some striking points of degeneracy, there is clear indication of Spanish origin. It is difficult, however, to account for the difference between him and other wild horses, that discover in size as well as in general formation that they are the descendants of animals left or lost upon the American continent by the early Spanish discoverers and conquerors.

These ponies are undersized; of very slight limbs; often ugly and disproportionately made; with long neck, long back, and long, slender and weak posteriors. Their hoofs are often badly formed, tending to flatness and irregularity. Their heads, however, though long, are lean, well shaped, and wellset; and their nostrils are wide. Their manes and

tails are fine. They have some activity and spirit, and are sometimes vicious, but not difficult to subdue. In a wild state, they are easily outwinded by well-trained horses of the larger breeds; but domestication seems to have the effect of improving their powers of endurance, as they do good service for the Comanche Indians as a cavalry horse—carrying those warriors, and enabling them successfully to evade the pursuit of well-trained United States cavalry.

Almost every color is found among them.

The *Indian Pony*, another American, is thought to be a degenerated Norman—having sprung from horses of that stock brought to Canada by the first French emigrants, and allowed by some means to escape into the forests, as was the case with certain Andalusians farther south. Wandering, from generation to generation, in those cold regions, and under circumstances altogether unfavorable to the production of generous growth, they have become dwarfed and in other particulars modified as to form. They seem in their present state to be a perfectly distinct animal; and they possess many points of excellence. They are found in the upper Mississippi country, on the borders of Canada, and west of the great lakes, and are used chiefly by the different tribes of northern Indians. Great herds of them are found in a wild state on the northwestern prairies.

They are a larger animal than the Mustang, and in most respects far superior to him. Though he is to be considered a true pony, he is often thirteen, sometimes even fourteen, hands high. The body is very strongly built, being round-ribbed, short-barreled, and with powerful limbs. The neck is thick and short; the legs are covered with thick hair, and seem somewhat heavy and clumsy, but they are as firm, muscular, iron-like and sound, as those of the Shetlands. The mane is very heavy, often falling on both sides of the neck, while the forelocks cover the eyes, and give a sort of shaggy appearance about the upper portion of the head; the tail is also heavy and generally inclined to be wavy. They have a high crest, and quite a proud carriage of the head. They are docile, intelligent, sure-footed, capable of enduring all the rigors of a northern Winter, and able to perform long-continued journeys, at a moderate pace, while carrying or drawing disproportionate burdens.

Their courage is so high that they do not readily succumb to any hardship, however trying its nature, and though coupled with poorness and scantiness of fare.

CHAPTER V.

BREEDING AND RAISING

I. IMPORTANCE OF THE SUBJECT. —— II. THE BEST STOCK THE CHEAPEST. —— III. HEREDITARY TENDENCIES AND IMMATURITY TO BE GUARDED AGAINST. —— IV. PRINCIPLES OF TRANSMISSION.——V. THE TWO METHODS, "IN-AND-IN" AND "CROSS" BREEDING CONSIDERED.——VI. TREATMENT OF THE MARE AFTER BEING SERVED, DURING PREGNANCY, ETC.——VII. HOW TO KNOW WHETHER A MARE IS IN FOAL.——VIII. HOW TO KNOW TIME OF FOALING. —— IX. ABORTION, OR SLINKING THE FOAL. —— X. HOW TO RAISE COLTS.——XI. MULES.

I. Importance of the Subject.

No subject connected with the rearing and use of stock can be of more importance to the farmer and stock-grower, the intelligent, practical business man, than that of breeding. That it is every way more profitable to any one who rears and trains a single colt to have that colt of the very best rather than of any indifferent quality is almost too palpable to need a moment's consideration. That it is possible for every man of observation and good judgment to improve his stock is equally obvious. There is no line of work which horses are called upon to perform that has not its peculiar requirements, that can be better met by some specific kind of animal than by one chosen at haphazard. It is a matter, then, of the plainest common sense that every one who means to rear a horse for his own use should consider beforehand to what purposes he will most probably devote it. If it is designed for market, he needs no less to consult his interests by determining what markets are accessable to him, and what description of animal will be apt to find most ready sale therein, at most remunerative prices.

For the farmer who wants to breed and rear horses of all work, it would be manifestly foolish to seek a high-priced pure-blooded race, for his

mares, unless the mares themselves were of such type as to render it necessary to breed to high and elegant stallions in order to obtain those medium-sized, but compact, and moderately quick-paced animals that are so well adapted to all the wants of the farmer.

On the other hand, one wanting a light and fleet animal would set his inconsiderateness in a striking manner who should so disregard all the dictates of sound sense as to hope to succeed by any chance selection of either mares or stallions.

II. The Best Stock the Cheapest.

It may be laid down as the first rule—a foundation principle—that *the very best and purest stock that is really adapted to the end in view should be sought after*.

It costs even less to feed a horse of good blood and lineage than it does to maintain a scrub; it costs no more to shelter him; it costs less to groom him and keep him in condition than it does to keep the scrub from looking like a scare-crow; his movement is almost invariably smoother and steadier for the same rates of speed; his temper is generally better; his pluck and energy not less so; and if it is found necessary to put him upon the market, he brings a better price. The service of a stallion known to be of good, generous blood, and possessing adequate powers of transmission, must of course cost more; there must be a dam adapted to the obtaining of a foal of the best type possible from such a sire; but the penny-wise, pound-foolish policy of refusing to avail one's self of these advantages, when in the bounds of possibility, is too apparent.

Taking it for granted, then, that the best, in this case, is always the cheapest—that the finer and purer the horse can be, other things being equal, the more useful, more easily maintained, and more marketable he is bound to be, it remains to consider some points that must always be regarded by the intelligent breeder, who seeks wisely to adapt means to ends rather than to trust to chance.

III. Hereditary Tendencies and Immaturity to be Guarded Against.

A caution most needful to be insisted upon at the outset is that relating to the transmission of tendencies to disease and of actual disease itself. It seems that no man in his right senses, knowing the results to the human family when this consideration is disregarded, would think for a moment of utterly ignoring the possibilities of evil consequences; but ordinary observation leads to the disclosure of the fact that among horses diseases and impaired constitutional powers are often transmitted in this way. Mares at an advanced age, too stiff, too weak, too slow to

be of any further active use, are turned to account for breeding purposes —and the result is, a weak foal, lacking thrift and lacking spirit. Mares hacked about until they are ring-boned, spavined, and splinted, or perhaps dropsical or with a glanderous tendency,—no longer useful on the farm or on the road, are relieved from the work which they can no longer do with any chance of profit, and sent to the stallion. Result: a foal with a rickety or knotty osseous system, or with a tendency to some form of dropsy, or ready, in the presence of any exciting cause, to develop a case of glanders. And so of other disorders, more especially of roaring, thick-wind, blindness, contracted feet, grease, and affections of the brain and nervous system. Some mares have a peculiar predisposition to surfeit, some to swelled legs, some to vertigo, some to a sort of unaccountable viciousness. No wise breeder can afford to disregard these things. If he wishes to rear a horse for service, he wants a sound foal; for he knows he can get from such a one more work for less cost than from one unsound in bone, muscle, secretions or integument. If he designs to breed for market he is aware that neither a puny nor a diseased creature can be palmed off there either to his profit or his credit.

To insure healthy, active, thrifty progeny, then, the dam must be *sound and vigorous;* and this is no less true of the sire. We dwell less upon the latter because it is of far less frequent occurrence for a broken down and diseased stallion to be kept for the service of mares than for mares of this description to be put to breeding because they are known to be fit for nothing else, but are erroneously deemed useful for this. The condition of the stallion, however, must not be overlooked. Every breeder must have a care to choose a vigorous stallion, and one free from blemishes, mal-formation and hereditary taints.

Nor should mares be put to breeding too young. They should be full grown and vigorous, and when their powers begin to fail they should no longer be subjected to this service. It is the practice of some to begin to breed at two years of age. This is injurious to the mare, and otherwise unprofitable to the owner. The growth of the mare is hindered; her form is modified both by the weight of the stallion and by carrying the foal. And the foal itself is apt to lack fullness and power. Yet, it takes from the young mother that sustenance which she needs for her own development, so that she is dwarfed, while it grows up a more or less puny creature—of insufficient value to compensate for the injury done to the dam. No mare should be so used till she is at least three years old—four would be the better and more profitable age. It is said that mares which are allowed to mature, and are well treated afterwards, will not lose enough of their natural vigor to disqualify them for bringing forth good foals till after they are twenty years old; but it is idle to

expect good, strong, well-formed, thrifty, and spirited offspring from a mare that is either too young or too old; or that is subjected, even in maturity, to hard work, poor and insufficient food, and cruel handling.

IV. Principles of Transmission.

Let us next notice this principle, that *when the dam and the sire both possess a due amount of vigor, the foal will combine in itself the most marked characteristics of both; while any quality that is peculiar to either of them is apt to be prominent in the offspring.* This applies to both disposition and physical conformation.

It will be seen from this statement that no matter what the general line of policy to be pursued by the breeder, that of *in-and-in*, or that of *crossing*, he must select his stallions and mares with the view to having one supplement the other. If the mare is deficient in any point, the horse should be full or predominant there, and *vice versa;* and if any peculiar trait is desired, that should be very strongly developed in either sire or dam, while merely nominal in the other.

Another special point to be considered is this: that for the production of a full-formed, symmetrical, vigorous, and thrifty foal, *the mare should be proportionately larger than the horse.* An overgrown stallion, of great power, serving a mare of diminutive size, or of size somewhat less in proportion than his own, will beget her a strong embryo that will require more room and more nourishment than the mare can afford; and the result must be weakness, and, probably, deformity—almost inevitably diminutive size. Men's minds were particularly called to this fact in Great Britain when, during a course of years, the farmers of Yorkshire thought that by breeding their mares to the very largest stallions they could find, and without regard to the size of the mare, they could meet the demand in London for great overgrown horses, which it was then the fashion to drive in coaches and other heavy carriages. The result was a race of almost worthless creatures.

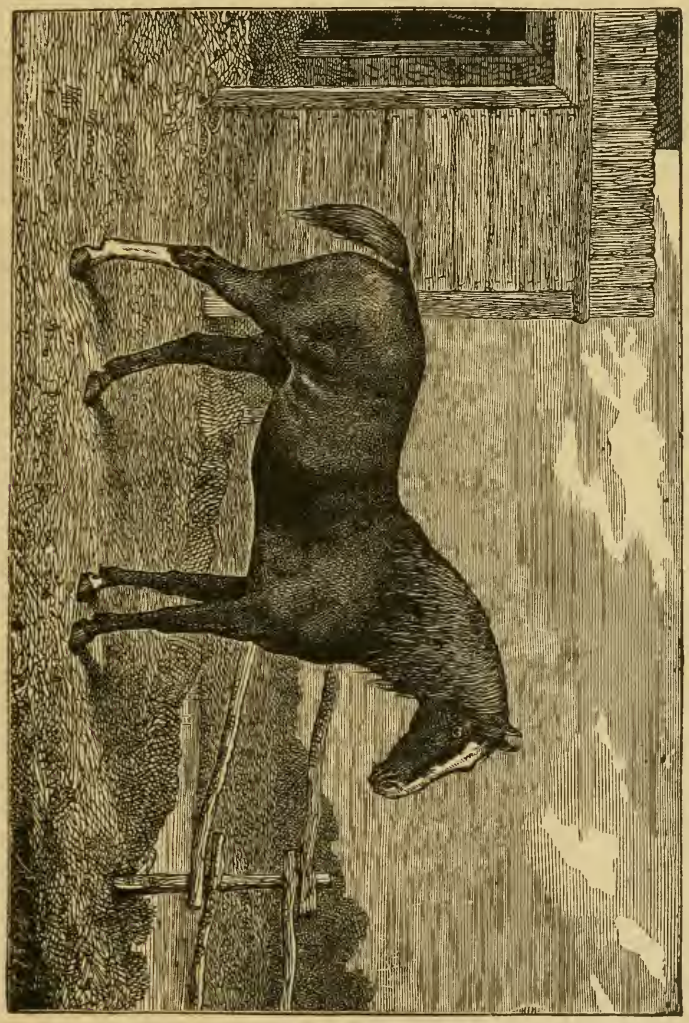
In other points than mere size, more depends upon the selection of the mare than that of the horse. The great majority are mares bred after their own stock unless the stallion is so powerful as to neutralize or overcome this physiological peculiarity; so that it is necessary for her to be of good lineage if the best results are wanted. If she has come from diseased, vicious, or in any way evil ancestry, though she may be free from perceptible taint, the bad points of her stock will very probably appear in her offspring. This principle makes it necessary to have a regard for her color and for the color that is known to have been prevalent in her line, since any dirty, vari-tinted, and otherwise disagreeable colors may appear in a foal of hers if her progenitors have had such a hue.

V. The two Methods, "In-and-in" and "Cross" Breeding Considered.

As for the two leading methods of breeding, circumstances generally determine which the farmer or other breeder on a moderate scale is to adopt. He is now almost always under the absolute necessity of crossing; and the main point with him is, *how* to cross, in order to secure the best results. The main directions are already laid down, with sufficient minuteness to enable anyone of ordinary intelligence to judge as to the best means. One point must not be overlooked, that really to improve the stock of horses as to blood—to obtain a strain that has the power of transmitting itself, and of so continuing in a steady line of improvement, recourse must be had to pure blooded horses. The English racer or thoroughbred is almost our sole reliance in this respect; although an Arab may occasionally be found. The true Norman Percheron is endowed with this characteristic of pure-blooded horses—he has great powers of impressing himself upon his offspring, and perpetuating the strain; but he is too heavy for the ordinary run of mares in this country; and if heavy draft stock rather than the lighter horse of all work is wanted, the Percheron mare should also be used—or some other of equal length and weight. Good mares of the common mixed breeds in the United States, bred to the light Arab, Barb, or thorough-bred stallions, will almost invariably produce foals partaking of their own size and strength, and of the finer forms, activity, and wind of the stallion. It is difficult to lay down any specific rule for crossing. The whole matter must be left to the good sense of the breeder, after the general statement of principles previously set forth. If the breeder has in view a mere racer, and is unable to obtain both thorough-bred mare and stallion, let him seek the racing stallion, at least, and one that will, as previously directed, supplement his mare—supply the points in which she is wanting for that specific purpose. If he wishes a trotter, the same care must be observed. As trotting horses are of late days in great demand in the United States, we insert here a cut of one of the most celebrated of the Old World trotters, the "Marshland Shales," a horse foaled in 1802, and which was known to old age as the very best in the British Isles. A careful study of his conformation will be of advantage to those who seek to learn the peculiar points of a horse of known excellence. He was a half-bred; and the impression long prevailed among the sporting men of England, (if it is even yet extinct), that no pure thorough-bred nor Arabian could excel as a trotter.

Now, let the reader compare him with "Dervish," and note the points of difference. "Dervish" was a little bay Arab, exceedingly fine, and remarkable for a *darting* or straight trot—throwing out his fore-leg and

straightening the knee before the foot touched the ground. He was sound, hardy, and a powerful foal-getter; and a cross with such a horse upon any well-formed, large and reasonably long-bodied mare, would be



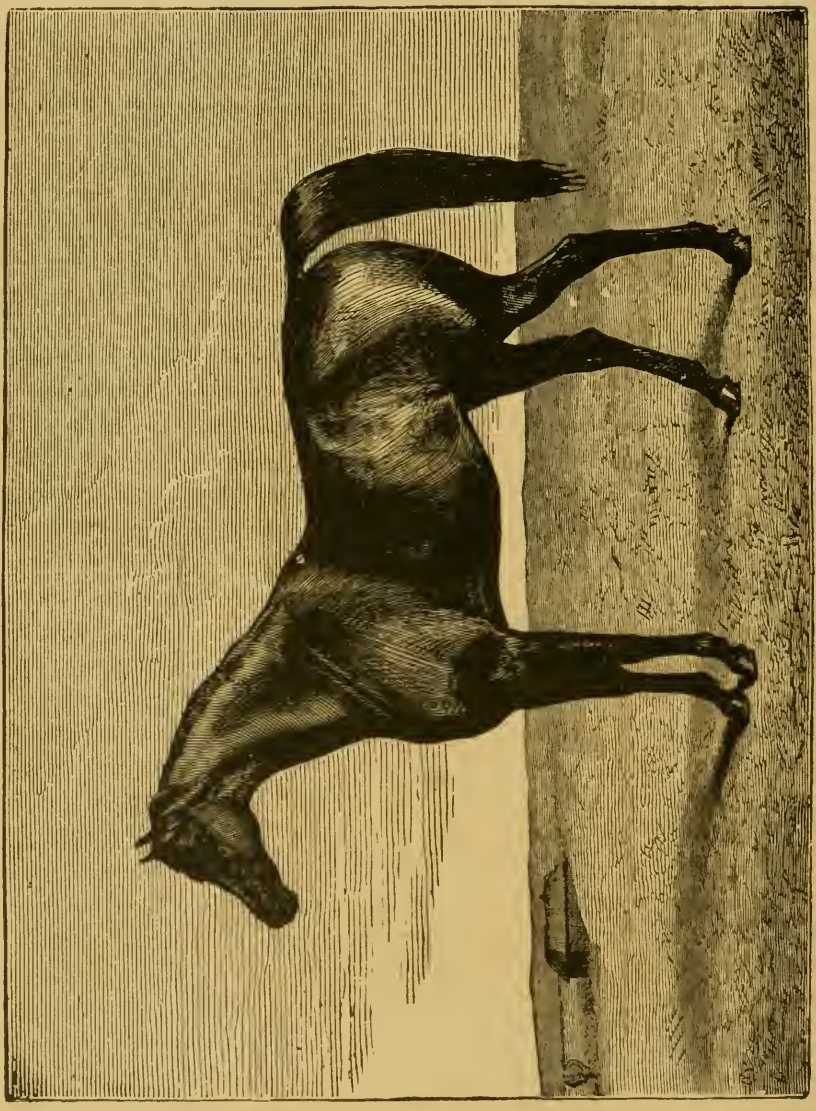
"SHAM."

apt to produce the beau ideal of a trotter—moderately large, long, yet compact, and with light and clean yet powerful limbs.

Notice particularly the cut representing "Gold Dust," a Kentucky horse, foaled near Lexington, the property of L. L. Dorsey, a few years prior to the civil war. He was mixed blooded, having been sired by

Vermont Morgan, a great trotter, while his dam had in her both Arabian and thorough-bred blood.

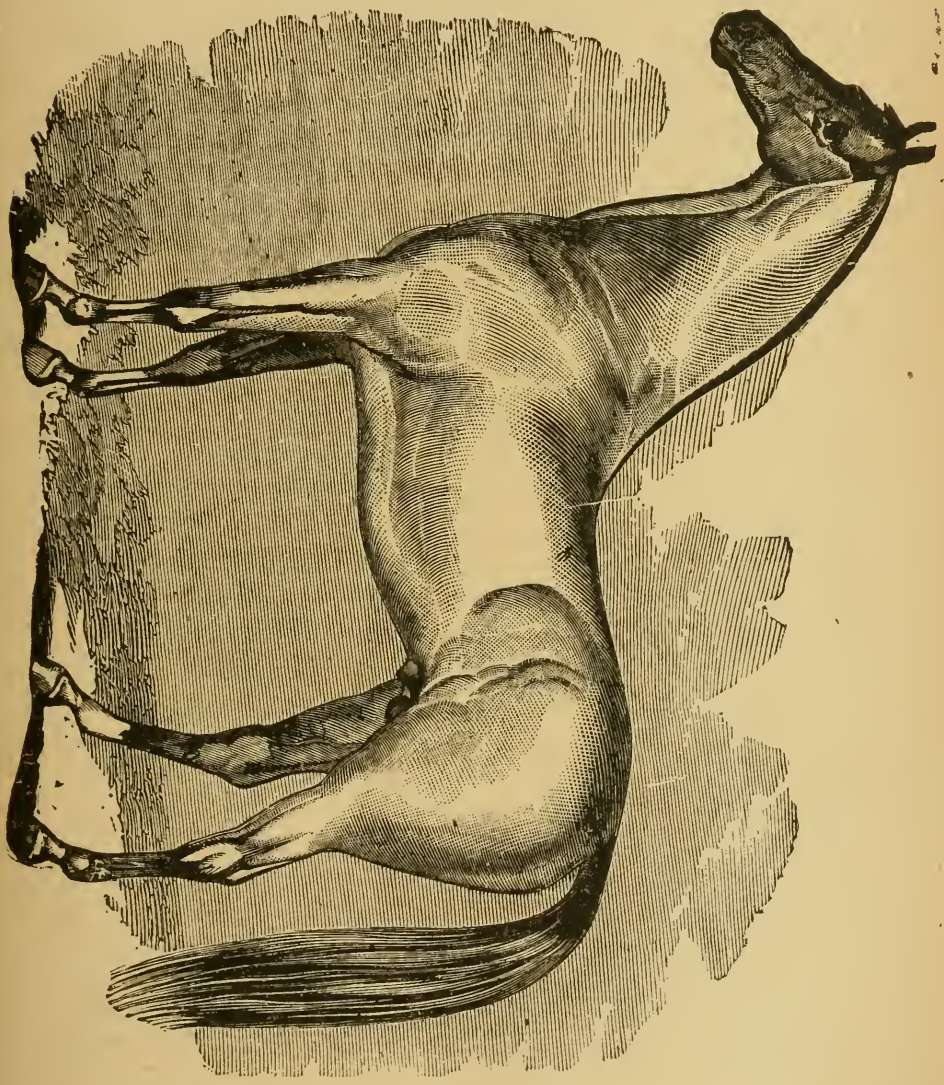
It is worthy of consideration on the part of the breeder that the colts of "Gold Dust" showed stronger marks of their Arabian and English



"DERVISH."

ancestry, which came by his dam's side, and remotely, than of the Morgan, his sire, so superior is the pure blooded horse as a transmitter of his own qualities, and an improver of breed. "Gold Dust" is worthy

of study. He was not only beautiful, but a horse of the finest action—a fast walker and famous as a trotter. When native American stallions such as he can be found, the owner of good mares need not repine if he finds it impossible to come at the much-to-be-desired pure blooded



"Good Dust."

foreigner. He may rest assured of getting improved colts, and of such character as will, if judiciously handled, perpetuate, to some extent at least, their own good qualities.

If it is heavy draft stock that is to be sought, the Norman Percheron

stallion, as we have previously intimated, ought to be had, provided the breeder has mares of such size as to render it judicious to put them to so large a horse; otherwise, the Norman Percheron mare may be most advantageously bred to some native stallion, say a Morgan, a good Canadian, or some other compactly built and quick-paced horse.

But it is unnecessary to extend these suggestions. If the breeder will consider with care what he really wants, and observe the points upon which we have touched, he will be at no loss to judge intelligently what course to pursue when cross-breeding is his only resource. He may often, of course, find it difficult to obtain just the stallion which his judgment tells him he should have for his class of mares; but this is a pointed argument in favor of that care which our farmers should long ago have exercised in this matter. Intelligent attention to the improvement of our stock throughout the Union will soon make it possible for them to *select* their stallions, rather than to be forced to take up with every hack that comes along with a flourish of red surcingles and a wonderful pedigree, manufactured to order.

As to in-and-in breeding, but little need be said. All the long-winded, voluminous, and learned discussions of the subject have resulted in adding but little more to our stock of knowledge than this: that too close in-and-in breeding is likely to bring about weakness, malformation, and general deterioration; but that to fix and preserve and intensify a certain strain, the Jew, (to speak in a figure), must not intermarry with the heathens round about him. In other words, to have true Morgans, both sire and dam must be of that stock, though of different families: to keep up the real Norman Percheron horse, we must have Norman Percherons, both male and female, to breed from; and so on.

The objection to close in-and-in breeding seems to be here: that nearness of kin is apt to be associated with likeness of qualities, both physical and mental, (if we may so speak of the horse); and thus the great requirement that one parent must supplement the other is not complied with. If there is a weak point in both, the weakness is perpetuated and made worse, whereas a weak point in one should be counteracted by a correspondingly strong point in the other. If it could be known with absolute certainty that two animals, close of kin, had strongly marked opposite traits of character, constitution and conformation, they might be bred to each other, and with the best of results. Such is sometimes the case; but it is not likely to be, and the rule should be as we have said—let the strain be the same, but the kinship as far removed as possible. This is believed by the most candid observers to be the secret of Arab success. The individual breeder knows not alone his own animals, but those of his tribe, and of other tribes as well Moreover, the Arabs

are close observers and astute judges of horse flesh, and an intelligent son of the Desert could by no reasonable means be induced to breed his mare to a stallion in which his eye had marked some weakness or evil tendency which he knew the mare likewise to possess, however slight the indications might be in either.

Then, to recapitulate briefly: if the breeder has it in his power to keep up a certain stock, let him guard against the slightest admixture of heathen blood; and to be as sure as possible of no evil results, let him look to securing sires and dams as widely removed from kinship as possible; but he can never afford to disregard the point previously so much insisted upon, as a principle to be observed in crossing, that if either parent has a fault, the other must be correspondingly strong there.

VI. Treatment of the Mare After Being Served, During Pregnancy, etc.

It is proper next to notice some little matters of detail in connection with the management of brood mares.

Forty-four weeks is regarded as the time which a mare goes with foal; but this must be taken as mean time, since one occasionally brings forth a perfect colt four or five weeks sooner, and others will go equally as long beyond this period. When once the time of a mare is known, the breeder can generally regulate her going to the horse so as to have the colt appear at whatever season he considers most desirable, but without this knowledge he cannot.

After having been served by a horse, the mare should be allowed to stand idle awhile, as conception will be far more apt to take place if she is left to herself. If put to brisk motion, or to any strain immediately after copulation, she is apt to fail of conception. She should also be kept away from string-proud or badly castrated geldings, not only at this period, but during her entire pregnancy, as they are apt to worry her to the casting of the conception, or, at a later period, to slinking the foal.

After she has been allowed a reasonable season of quiet, moderate work will be rather beneficial than injurious; and this may be kept up until about the time of foaling. Special care should always be exercised to guard her against being kicked, heavily thrown, or inordinately strained in any way.

It sometimes occurs that at the time of foaling, a false presentation is made, producing difficulty of delivery; but no reliable instructions can be here given as to what course to pursue in these cases; and it is best to seek the aid of some skillful veterinary surgeon.

The mare which has had a colt will be found in season sometime within the next thirty days, and she ought to go to the horse at this time if she is to be bred at all. The ninth day after foaling will generally be found

to be the right time. Whenever indications of heat are discovered, the matter should not be delayed, as the season may pass off and not return. After putting, the days of trial are the ninth, then, if she refuses, the seventh after this, and upon a second refusal, the fifth after this, which is sufficient to prove her.

VII. How to Know Whether a Mare is in Foal.

It is often important for both breeders and traders to know whether a mare is really in foal; and one writer has published the following directions for determining this point, which he says may be implicitly relied on:

"After the first service of the horse, and before the next trial, on examining the vagina, or bearing, if conception has *not* taken place it will be of a fresh, bright, or florid and moist appearance, with a clear drop appearing at the lower part, and which, if touched, will incline to extend; but if conception is present, a different appearance of the surface of the vagina will be presented. It will be found dry, and of a dirty brown or rust color; and a dark, brown looking drop will replace the former clear drop. When these latter appearances are present, pregnancy may be regarded as certain."

VIII. How to Know Time of Foaling.

Two days, (in some mares only one), before foaling, a sort of sticky substance will be found protruding from each teat, somewhat resembling drops of milk. Care should now be taken to provide a suitable place for her, as this is a certain indication of near delivery. She should be removed from other animals, and a careful person should see to her often enough to guard against accidents.

Before the signs referred to, as shown by the teats, however, there is on each side of the spinal column, from the tail to the haunch, a furrow-like fold; and the bag will generally be found considerably increased in size. These signs show that delivery is not very remote, but cannot be relied on to denote the day.

IX. Abortion, or Slinking the Foal.

When about half the time of pregnancy is passed, more than ordinary pains should be taken with the mare, as it is at this time, if at all, that she is apt to slink. She ought now to have better feeding, and even gentler handling than she had previously; though at all times the owner but consults his own interests when he carefully guards her against ill usage. She has more need of food, and is less able, at this time, to endure hunger, as the rapid growth of the fœtus makes a constant and

severe draft upon her system. Want of care may cause abortion; and if a mare once casts her foal, she is apt to do so at a corresponding period of pregnancy afterwards,—more especially if like provocation occurs.

Various other causes of abortion, some of which may be briefly adverted to, for the purpose of pointing out certain preventive measures and suggesting others. Blows, strains, and any violent excitement may have this effect; and it is said that to allow a mare to see and smell food to which she has been accustomed, and of which she is fond, without suffering her to eat of it, will cause slinking. Feeding hogs or other stock upon corn, in sight of a mare that is not also thus fed, is, for this reason dangerous. Sympathy is a known cause: a pregnant mare, seeing another cast her foal, is apt to be affected in like manner. Nervous spasms, or a sort of animal hysteria, resulting from sympathy of the womb with a diseased stomach or other organ, occasionally results in causing the foal to be cast. Some affirm that a smell of blood, or of freshly slaughtered meat, will do it.

If a mare slinks because of a hurt, a strain, or some acute attack of disease, she is not apt to fall into the habit of abortion, provided proper care is taken to guard against exciting causes at a corresponding period of her next pregnancy.

When once this tendency is established, however, it is difficult to counteract it, as the slinking is more than likely to take place at times when the mare is not under observation. If symptoms of casting chance to be discovered in time, it may be prevented by promptly burning pigeon feathers, (or those of other birds, if these cannot be obtained), on a hot pan, or a pan of coals, and holding them so that she will be obliged to inhale the smoke.

X. How to Raise Colts.

If the colt is healthy and thriving, he should be weaned at from five to six months old. If allowed to run with the dam after this period, he is an unnecessary burden to her, since he has already learned to pick up and devote to his own use other sustenance, and he may most judiciously be taken away. If at this time the dam is still inclined to furnish milk so copiously as to render the udder painful to her, she should be looked after for a few days, to see that the over fullness does not result in inflammation and swelling. If necessary, draw away the milk by hand once a day for three days. It is a good plan to keep her at this time on dryer food than usual, and at more than ordinarily steady work. This course will tend to prevent the secretion of the usual quantity of milk, and the udder will soon be dry.

No matter how well born a colt may be he can never amount to anything if raised a starveling. If the dam is what she should be, he will have been furnished with abundant sustenance from the time of conception to that of delivery, which is one of the secrets of full-formed, finely-proportioned, vigorous foals. From foal-time to weaning he will have been kept vigorous and growing by the quantity and character of the milk furnished him, together with such little food as he has early learned to partake of at the manger and in the pasture of the dam. And now, upon being weaned, it is of the utmost importance that he have liberal food and sufficient protection from the inclemencies of the weather. This must be carefully attended to during the whole period of growth if he is expected to make any adequate return to the owner. Bruised oats and bran have been recommended as the very best food to be given for a considerable time after weaning. In any event let his food be supplied with regularity; and it must be nutritious, yet of such kind and so disposed as to be easily partaken.

He should not be stabled too much, nor in any other way too closely confined — being allowed all that range and exposure to out-door weather common to older stock in the more clement seasons; but he should never be left out in cool rains nor in the storms and biting cold of Winter. If a place is provided in which he may always shelter himself when the condition of the weather inclines him to seek cover, it will save trouble and yet insure a natural growth and that hardihood which comes of sufficient contact with cold and heat. For this purpose a straw rick is sometimes recommended — so constructed as to furnish shelter on the leeward side. This will give at the same time both bedding and a light species of food.

Provision must of course be made for his obtaining readily, and at such times as the wants of nature may dictate, plenty of pure water — the purer the better.

Thus much as to food, drink, and shelter. Another point of importance must not be omitted in his raising, that is, familiarizing him with his master or with whomsoever has charge of him. He should be handled sufficiently and in such a way as thoroughly to overcome all shyness, and to lead him to feel that man is his friend. This confidence once established, his training — when the proper time comes for that — will be easily and successfully accomplished; his subsequent relations with his master will be always pleasant, and his value thereby much enhanced.

And this, indeed, touches a fundamental principle in the care of all dumb beasts. Lead them to recognize that man is their friend; that they can depend on him to advance their comforts, and to secure their welfare.

XI. Mules.

The breeding and rearing of mules, so common in many portions of the United States, requires more than a passing consideration. To obtain the best results in crossing with the ass demands as much intelligent care as in the case of the horse: and the mule-breeder will find it much to his advantage thoroughly to inform himself as to how these results are to be obtained.

Many mistaken impressions prevail as to the relative usefulness of the mule, as compared with the cost of breeding and maintenance.

It is thought by the inexperienced that he is almost equally adapted to every kind of draft work to which the horse may be put; that his power as a pack-animal is much greater than that of the horse; that his endurance is greater; that he can subsist on less food; and that he demands every way less care. All these things are set down to his advantage; but in most instances the impressions are wholly erroneous. As a general thing, he is not well adapted to road or to city purposes at all. Especially are hard roads and pavements destructive to him if he is large of body and disproportionately small of leg. He is not so stout as a horse of proportionate size; he is utterly incapable of carrying so great burdens as some have represented, even if loaded and attended by experienced packers,—particularly if the journey is to be continuous and the roads are at all heavy; his powers of endurance are not greater than those of the hardier kinds of horses; he will consume as much food as a horse of proportionate size, if required to do like work and to maintain a like condition; and as to care, he can do without it—so can a horse—but both fail thereby of that eminent thriftiness, sprightliness and longevity which is to be expected of animals to which it is extended.

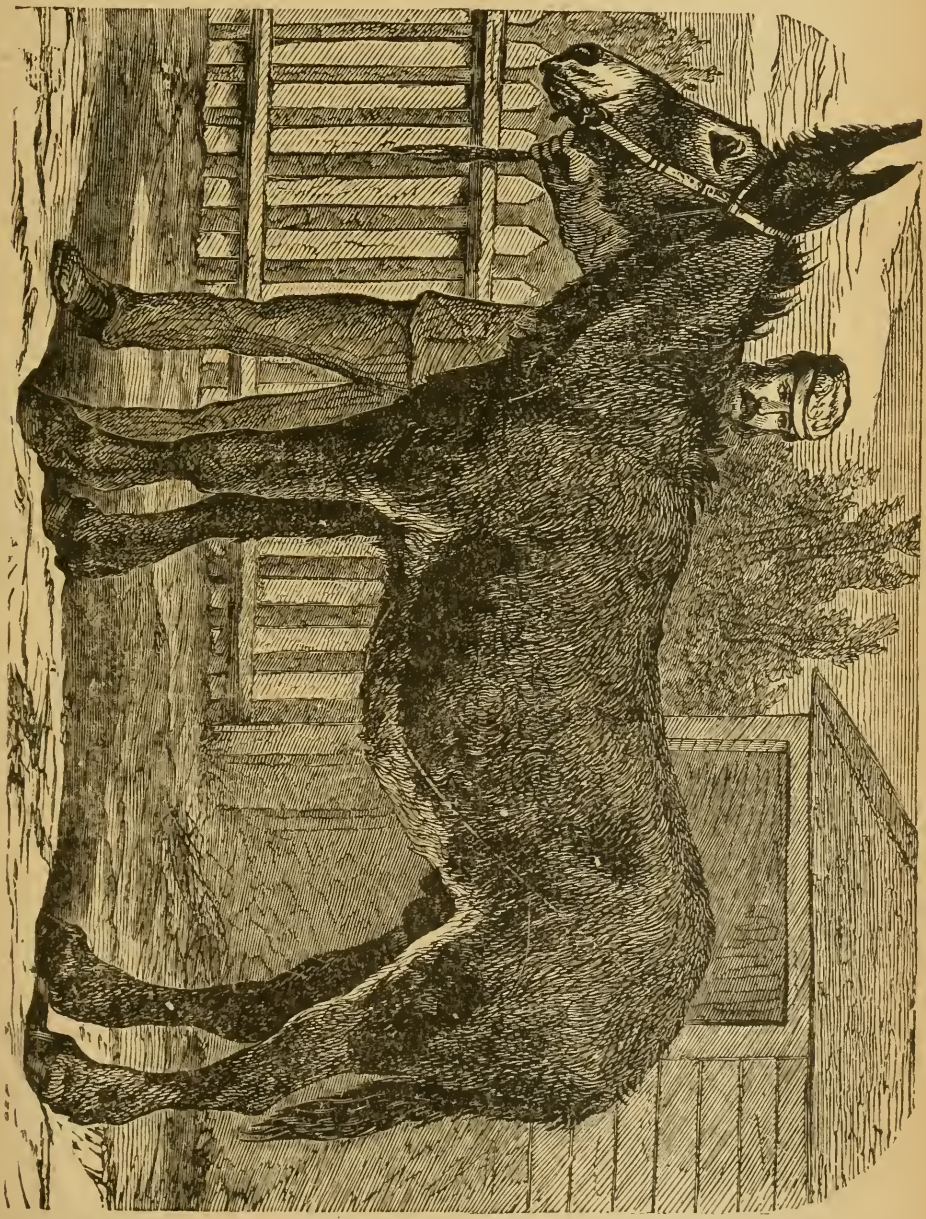
On the other hand, and to his discredit, it is commonly thought that he is naturally vicious, and wholly incapable of appreciating kindly treatment—that the only way to control him is by violence. Hence, those who handle him generally feel as though they are justifiable in whipping, beating, kicking and whatsoever other cruelties they may choose to inflict. This is a grievous, foolish and wicked mistake. The mule has one means of defense, and his heels are dangerous to those who wantonly provoke or startle him and place themselves in his way. His long ears are sensitive, and by roughly handling them his combativeness is easily aroused, and distrust is awakened to that degree that renders him almost unmanageable. Yet, the mule may be so raised and trained as to make him gentle, obedient, even affectionate and ready to follow his master like a dog—so trusty that only the one always necessary precaution need be observed in dealing with him—to keep out of the way of his heels, which

he throws out as instinctively when startled, irritated or approached by a stranger, as a cat thrusts out her claws. It has been remarked that "when a mule gets perfectly gentle, he is unfit for service;" and that, taken in connection with the prevailing method of training him, is doubtless true; but there is a better way, and, if followed, it would result as we have stated above.

Now, while the mule is not adapted to everything, and endowed with powers that are adequate to endure starvation and brutal treatment while in the performance of hard and faithful service, he is admirably calculated to meet many of the wants of individuals and corporations; and his breeding, rearing and training are matters for intelligent consideration. For supplying the army he cannot be replaced; for towing canal boats he answers admirably; for hauling cars inside of coal mines, he is indispensable; for the general knock-about work of a farm he is good in all temperate climates; and in a cotton and sugar country, where it is warm and sandy, he is most especially valuable. Though he cannot endure everything and still meet every requirement of a heartless task-master, he is yet gifted with a hardihood that is admirable, and recuperative powers that are astonishing. Seemingly half dead, utterly broken down and worthless, he will, with a little rest and care, soon be again ready for service.

In breeding for mules no less attention should be paid to the selection of suitable mares and a suitable jack than in the case of horses. It is folly to use old, worn-out, diseased, ill-formed, ill-conditioned mares, and yet hope to obtain a good foal. As a general thing a great, overgrown, long-legged mule is next to worthless. He is expensive to keep and unreliable as a worker—lacking wind, strength and nimbleness. The medium-sized, clean, compact mule is by all odds the best, unless a team can be found to combine more than the ordinary height with round bodies, not disposed to fleshiness, and larger, stronger legs than usual, with feet above the common size—which is seldom the case. The Spanish or Mexican mule—the offspring of stout, close-built, active Mustang or Mexican mares is superior in endurance to any known in the United States. He requires less food, takes it quicker, and is always in better fix for travel. If it is more profitable to raise good animals than poor ones, (and no man of ordinary intelligence can doubt this proposition), select mares for mule bearing that are sound, compactly built, and yet without any contractedness of body—active, strong, every way serviceable. Then, the choice of a suitable jack is important—doubly so from the fact that the great majority of mares breed after the jack in the matter of legs and feet, and, if it is a good and powerful jack, the foal will generally bear his marks, which is a matter of some importance.

since mules so marked are always regarded by experienced stock men as being most hardy and valuable. The jack should be large—the larger the better, other things being equal, since it is impossible to find one so



POITOU ASS.

much surpassing in size the mares we have described as to render him objectionable on account of disproportion, as may easily be the case with

a horse. Most especially must the breeder have an eye to his legs and feet; for here, if at all, the mule is apt to be a failure — having a horse's body, ready to take on flesh beyond his requirements, mounted on legs that are too slight of bone and too small of muscle, with feet below the standard size for highest usefulness.

The cut on preceding page is a portrait of a large and powerful Poitou ass, an animal much valued in that district of France for breeding heavy draft mules from cart mares. The one here represented has been described as being fourteen and one-fourth hands high; greatest girth, seventy-seven inches; girth behind the shoulders, sixty-six inches; length of ear, fifteen inches; ears, tip to tip across, thirty-two inches; with hoofs much larger than those of the common ass. Compare him with the small, light ass, now in too common use among us. The difference seems to be almost one of kind; and with these representations in his mind, no observant stock-grower can be persuaded to put up with a poor pretense of a jack for the service of his mares.

As for the treatment of mares that are to be thus bred, no farther directions need be laid down, since it must be substantially the same as that prescribed for the breeding of horse foals. The like instructions relative to weaning, feeding, and sheltering the colt must also be carried out; and too much importance cannot be attached to beginning early the work of familiarizing him with man. He should be taught to regard his keepers without fear, to allow himself to be haltered, and readily to submit to direction and guidance. If this is done, he will be easily trained, when the proper time shall have arrived; and if properly handled and judiciously taught then, he will be not only a useful, but a trusty and agreeable animal.

CHAPTER VI.

HOW TO BREAK AND TRAIN A HORSE.

I. AMERICAN VS. ENGLISH FOALS.——II. AT WEANING TIME.——III. THE FIRST LESSON.——IV. TRAINING.——V. TRAINING TO WORK.——VI. TRAINING TO BACK.——VII. TRAINING TO SADDLE AND HARNESS.——VIII. TO HANDLE A HORSE.——IX. HOW TO HANDLE A VICIOUS COLT.——X. SADDLING AND HARNESSING.——XI. HOW TO SUBDUE A VICIOUS HORSE.——XII. HOW TO TRAIN TO THE SADDLE.——XIII. TRAINING TO TROT IN HARNESS.——XIV. HOW TO TRAIN TO TROT IN LIGHT HARNESS.——XV. HOW TO TRAIN FOR THE PLOW.——XVI. TRAINING TO THE WAGON.——XVII. HOW TO TRAIN A RACER.——XVIII. TRAINING A STALLION

I. American vs. English Foals.

It is a common remark among Englishmen visiting America that our horses are more easily controlled and managed in the breaking in and training than English horses, and hence they have been led into the error of supposing that they were deficient in courage and spirit. Nothing could be farther from the fact. The true reason is, the growing foals in the United States are more the companions of the children of the farmer than in England. They are not as a rule, beaten and abused, and thus do not find their real powers of resistance as they do in England under the handling of hirelings of little intelligence, and almost no education. In the United States the fondling of the colts and fillies commences almost with birth. They are special pets of the boys of the family. On the farm, and even on the road, the mares are often regularly worked with the colts running at the feet, a very bad plan for the colts, and

especially so for the mares, but which, nevertheless, early accustoms the young animals to strange sights, while it renders them tame and confiding.

II. At Weaning Time.

The true education of the colt or filly should begin early; at weaning time. They should then be haltered and taught to lead, to stand quietly in the stall when tied. After this is thoroughly understood the colts may then have their liberty, for there is nothing more healthful, or better calculated to develop those powers necessary to the exhibition of speed, endurance, or great muscular exertion, than constant, every-day exercise, which all young animals naturally take in their play, and this often of the most violent character.

III. The First Lesson.

The first lesson the young foal should be taught is to come readily at call. This is easily accomplished by providing one's self with delicacies, such as sugar and salt, of which horses are especially fond. If there are a number of them they will all take the lessons together, and easier, for the most intelligent will assist the others. At the same time they must be taught to be quiet by a light tap of the whip to unruly ones.

In haltering, the colt or filly should be approached from the near side, the halter in both hands. Let the colt smell it until it no longer fears it, when, holding it properly in the left hand the right hand may be passed over the colt's neck and taking the strap of the halter it may be drawn on and buckled almost before the colt knows it. In case the colt should be wild, shy, or vicious, it must be confined in some place where the halter may be put on, but no haste must be manifested, until at the moment when it is to be buckled. Then do it quietly and quickly. If very strong, two ends of rope, each ten feet long, should be attached to the ring of the halter, and a free passage out of the stable allowed, one man holding each rope. In the case of a colt three or more years old, and strong, these ends should be twenty feet long, and the halter should have a cavesson so the muzzle will be pinched during violent struggles. The men holding the ropes—there may be one or more, according to the struggles of the animal—are not to seek to throw the colt or horse, but simply to restrain him in his struggles to escape. The yard should be soft so that if the colt falls it will not be injured. But if the animal does fall, when down it should be firmly held so for five minutes, or until resistance entirely ceases. As a rule, before the expiration of fifteen minutes, the colt will take a lick of salt from the hand and thereafter follow quietly. As soon as the colt gives up he should be led to the stable,

tied, given a little water and fed, and then be left to himself, being certain he can neither break the halter or injure himself. As before stated, the foal once haltered, taught to stand quietly, and to lead kindly it may then be given its liberty until of the proper age for training. The animal three years old and over once in hand should be thoroughly broken and made waywise without delay.

IV. Training.

The regular training of a colt or filly should begin at the age of two years past. There are many urgent reasons for this; first, the animal has neither the full strength, nor the disposition to resist, that it will have at a more mature age; second, it is more tractable, and will acquire its lessons more easily; third, it will not have contracted habits of self-will difficult to be broken off; and fourth, lessons in flexions of the body may be taught that will naturally increase its usefulness in whatever direction it may be wanted.

In the whole manner of breaking and training the trainer must not only understand himself, but the young horse as well and also as of special importance, the particular use for which the animal is intended. If the colt is of cold blood, that is of no particular breeding, it will not pay to spend much time on its education. It is simply to be taught to lead quietly, to stand still to be harnessed and unharnessed, to be accustomed to the ordinary sights and objects he will encounter, to work quietly at the plow, or other farm implements, and to the wagon on the road, and to stand quietly when tied on the public streets. If to be trained as a road horse, or as a saddle horse, or both, or as a hunting horse, a trotting horse, or a racer, all these will require special, and sometimes, long continued lessons according as the animal is intelligent and tractable or otherwise. It should always be remembered, however, that there is nothing gained by cruelty and abuse. A contrary animal may be punished, but it should always be done calmly and with judgment.

V. Training to Work.

The first lesson for any use is implicit and perfect obedience to the will of the master. This thoroughly accomplished the rest of the task is comparatively easy, it is only a question of time. It is supposed the animal is entirely free from acquired vice, that it has been halter broken, and taught to stand quietly at the end of the halter, to follow quietly, to lead by the side of the master, and to stand quietly in the stable.

The next step is to procure a bitting bridle, a strong bridle with a heavy smooth snaffle bit with a tongue piece and keys depending from the center

of the bit, it must also have a check rein that may be lengthened or shortened, and two side straps one on each side. The harness is simply a very wide strong surcingle, with padded back piece, having at the top a strap and buckle to form a loop for the check rein and also a buckle on each side of the surcingle in which to buckle to side straps. To the rear of the pad of the circingle is attached a back strap and round crupper strap, the latter to buckle and unbuckle.

Take the harness, and approaching the colt in the stall, let him smell it until satisfied, then put it on without undue haste or fuss. If the colt is nervous or skittish, talk to him and take time. The harness on, put on the bridle, giving plenty of length to the check rein and side straps, so the colt will not be unduly hampered, and let it out in a smooth, tight yard, following it about with the whip under the arm. Sometimes a strong colt will struggle and sweat violently, but if he has been properly handled heretofore, he will take the subjection pretty much as a matter of course. Let him exercise an hour a day for a few days, tightening the check rein and side straps gradually, until his head is brought into proper position, but not a constrained position. When he ceases to fret at the harness, pass the snap of a leading rope through the near ring of the bit and snap it into the off one. This rope should be about fifteen feet long. Taking the end in the hand, exercise the colt in a circle, allowing him to walk if he will. When somewhat tired let him stop and standing in front of him, say *come*, tapping him lightly on the fore-legs with the whip. If he pulls, hold him firmly, but without undue violence while he resists, tapping him on the fore-legs at intervals, using the word *come*. He will soon find the way to escape the whip to be to get near to you. Then fondle him and give him a trifle of sugar or salt and let him follow to the stable. So proceed from day to day, exercising him in a circle both to the right and left, (lunging it is called), gradually increasing his pace to a fair trot, until he will work as you want him, turning at the word to the right or left circle, or to stand and come to his master at the word of command.

VI. Learning to Back.

This is one of the most difficult things to teach a colt properly, and one most commonly slurred over. No horse is properly trained for the most simple use, until he will back as readily and as perfectly as he will go forward. It should be taught him while in the bitting harness, so that at the command to back he will do so to the extent of one or more steps. This is done first by standing in front of the colt and taking a rein in each hand; or take hold of the rings of the bits themselves. At

the word *back*, use pressure enough to curb the neck somewhat, but not enough to force the body in such a position as to cause the center of gravity of the animal to be strongly displaced. In backing, a hind leg should be lifted first, then a fore leg, and so on in rotation, the reverse as in walking. When the animal will back promptly and in line for ten or fifteen steps consecutively, the further lessons may be safely left until the time when the rider is in the saddle or in the vehicle behind the horses. Sometimes the motion may be made by standing at the side of the animal. However it is accomplished, if strong resistance is made the lesson must begin again and again until it is entirely comprehended and well executed. When so, a slice of sweet apple, carrot, a little sugar, or something the animal likes may be given it.

VII. Training to Saddle and Harness.

We have stated that the colt should be broken at two years old. At this age, however, it should never be put to hard labor. The work at two years old should be more in the nature of exercise than anything else, and this exercise should be to insure proper flexions of the body and limbs than for the amount of work the animal will accomplish, bearing in mind always, as before stated, what the animal is designed for. If as a saddle horse solely, or in connection with light driving, it is absolutely essential that the flexions should be thorough. The word flexion is but another name for rendering the head, neck, body and limbs perfectly supple. The animal must first have been rendered so quiet and obedient that he will not strongly resist the will and action of the trainer.

Put a bridle with a curb-bit on the colt, being careful to know that it fits and that there is space between the chain and jaw, so the finger can be easily slipped between. Standing in front of the horse, seize the right curb-rein with the right hand, about six inches from the branch of the bit, and the left rein with the left hand at about half the distance from the branch. Draw the right hand towards the body, pushing at the same time with the left, so as to turn the bit in the horse's mouth. If the horse backs, continue the operation until he yields. When the horse flexes his jaw and lowers his head, let the left hand slip along the rein to the same distance as the right, then drawing the two reins equally bring the head near the breast, and hold it there oblique and perpendicular, until it is sustained of itself. The horse will give notice by champing the bits.

The jaw is flexed to the left by a contrary move as given above. So the horse may be made to hold his head up, and perpendicular, to lower it, so the trainer can make the horse flex his neck to the right and left.

Standing at his shoulder, the trainer may make him move the hind-legs to one side or the other, the fore-legs remaining stationary, or to move the fore parts in a circle the hind-legs remaining intact, and this by means that will naturally suggest themselves.

But in all this there must be no ill temper displayed by the trainer no matter how bad the horse may act. Even if it be necessary to punish him the operator must be perfectly cool, never speaking in a loud voice or doing anything to cause undue resistance in the animal. The object is to teach the animal subjection to the will of man, and this can never be done by intemperate violence. Our practice has always been to break at two years old so the animal may become way-wise, flexible to the bit, to draw light loads, and under the saddle to walk, trot, or gallop, at command. Then at the age of three to four years, we let it again have its liberty The reason of this is, at this age the colt is shedding some principal teeth, and therefore not fit for work. If the lessons have been carefully given they will never be forgotten. If however he be properly fed, in the stable, he may continue to do light work through his third and fourth year. In no case, however, should he be put to heavy draft until he is five years past. As a carriage horse, the animal should not have hard work until he is the same age. Then he will get better and better until eight years old, and often do good service at the age of fifteen to eighteen and sometimes when past twenty years of age. There are more horses ruined between the ages of four and five years than at any other age.

VIII. To Handle a Horse.

As we have stated, the foal should be handled as early as possible, and by different persons, to early accustom it to different sights and sounds, but always gently. It should be carefully brushed so as not to irritate it; its feet should be lifted and lightly tapped with a hammer; a head stall should be put on the foal having a ring but no strap, but so the strap may be attached at any time to lead and exercise it. Thus, the trainer beside it, the colt may be taught to walk, to trot, or stand still, allowing it to do pretty much as it likes, within bounds. Never beat it under any circumstances at this age. Reward it with a trifle of sugar, or a little bread, or a slice of carrot, and fondle it when it has done well. Remember the future horse is to be the servant of man for ten or fifteen years of his life, and that it will pay to take pains with the education of so noble an animal, if well bred. In this day and generation it is money thrown away to breed or handle any other, whatever the breed may be.

When the foal is six months old strap a pad to its back and attach stirrup

leathers so they may flap about. In the Spring following its birth put a colt's bit in his mouth, with keys attached. Rein him comfortably to the surcingle, to which a crupper must be attached. In this, however, everything must be easy to the animal. Don't try to get his *head up*. He may be flexed from time to time, that is taught to open his jaw to the left and right; to turn his head to the right and left shoulder; to raise and lower his head; to turn with his hind or his fore-feet in a circle, those not used being the pivot; to come to his trainer at the word; to back, to guide right or left by the rein; in fact at the age of two years he may be made pretty well waywise, so that when actually ridden, or hitched beside a steady horse, there will be little fear or resistance to combat. To get him used to the rattling of a wagon, tie him by a leading strap to the trace buckle of the back band to the off and also to the near horse in the team. This will instruct him and get him used to the word, and to walking and trotting quietly. All this may seem like taking a great deal of trouble, but remember that much of it may be done while doing the ordinary labor of the farm.

IX. How to Handle a Vicious Colt.

Suppose you come into possession of a wild colt at three or four years old, or one that has never been handled. Put him in a close place like a narrow stall, where he cannot turn round or by any means escape. Put on a cavesson halter (a cavesson is a nose-band) and it may end under the jaw in a running noose, so as to press with force when drawn tight. Have lunging straps attached to the halter ring and securely fastened. Allow the young horse free access out of the stable, being careful not to throw him down before he gets out. Let the yard be rather small, but quite tight, and with none near except his trainer and assistant, who holds the ropes. Thus with a strong man to each rope acting in concert the wildest colt may be handled without danger. Let him struggle and rear and plunge, the ropes being well spread to each side. If he rear, ease on the ropes so as not to throw him, checking him as he comes down again.

Only one person should speak, the trainer, using only the necessary words and those spoken in a firm but rather low tone of voice.

Have a good and reliable whip, a long, straight, flexible one, but not for use except in cases of an emergency; as in case the horse should get his liberty by slipping the halter and turn to fight. Then it must be used determinedly, but without exhibition of temper. If he rushes on you, a sharp, strong cut across the muzzle, avoiding the eyes, to be followed by others, as necessary. This will subdue him. If he kicks, a determined sharp cut over the hind legs next the body, will tame him.

A self-possessed man, understanding the use of the whip, is in but little danger from a young horse. But there is no need that the animal escape. The straps and leading ropes must be secure.

When the colt gives up, let the assistant hold the rope, while the trainer, with the whip under his arm, the butt forward, gently and gradually shortens his rope, advancing to the horse. Take plenty of time, speaking firmly but soothingly to the horse, watching for any indications of vice. If the ears are held naturally or thrown forward, all is right. When mischief is intended they will be thrown back. When the horse allows you to approach him and will smell the whip or your hand, give him a trifle of salt or sugar, rub his nose gently, and induce him to follow you. Then lead him into the stable and tie him in the stall securely. From this time on he should have a daily lesson until broken.

One thing must be remembered; in first tying up in the stable, the halter must be so strong that the animal cannot by any possible means break it, and so perfectly fitting and secure that he cannot slip or rub it off. Thus you will never again have to break him of pulling at the halter.

X. Saddling and Harnessing.

The training of the horse fairly commenced, it should proceed day by day. Get him used to the harness and saddle by putting them on every day. Do not throw them on. Buckle every strap as carefully as though the animal was to be taken to work. The saddle being allowed to be put on without restiveness, and kindly taken, gradually draw the girth tighter from day to day until sufficiently tight so it will not turn. Begin by bearing some weight upon it, first with the hand and then by pulling on the stirrup. If the colt cringes at first and leans over to the side pulled upon, it will soon get over it, and will at length allow the full weight of the man sitting upright upon the saddle in the stall.

Then accustom the colt to being touched in different parts of the body with the legs, to be squeezed somewhat with the thighs and knees, mounting and dismounting repeatedly. This being permitted, lead him out of the stable, and while an assistant holds him by the bridle above the bits —not by the reins—the trainer mounts, the assistant lets go, and in nine cases out of ten the horse will move off at the word of command. If he does not, use no haste; give him time. If he rears and plunges, the rider must have full command and confidence in himself, or else quietly dismount and use the previous course until the animal understands what is wanted. If the rider is master of the saddle, and the horse plunges or throws himself about, get him into motion in a field of not less than ten acres, and if rather soft, so much the better; circle him about the field

until he wishes to stop, and then force him forward until he is thoroughly tired and subdued. Ride him to the stable, gentle him, wash his mouth, let him take two or three swallows of water, add a taste of some food that he likes, and the real work of breaking is done. Thereafter it is simply a question of training.

When the horse is to be put to the wagon, know that the harness is strong, and that it fits perfectly and easily. If the colt has been tied beside another horse on the road, until he is not afraid of the wagon, so much the better. Hitch him beside an old, thoroughly broken horse, tying the doubletree back so the steady horse may pull all the load if necessary. Get quickly into the wagon while an assistant is attracting the attention of the colt by talking to him and stroking his nose; pick up the reins and bid them go. Keep the broken horse in a walk or slow trot, as the case may be, and the colt will generally take kindly to the work in less than five minutes. Drive for about half an hour, at a walking pace if possible, letting the colt have his own way if not too awkward and ugly, turning from right to left in rather long curves. When the colt shows signs of fatigue, and certainly before he is tired, but not until he has ceased resistance, drive to the stable and unharness carefully and quietly as before described.

XI. How to Subdue a Vicious Horse.

If he be a colt that has never been handled, the directions we have given for bitting and training will succeed. If he has been made tricky by a previous owner, who was timid, go into the stable when he is tied, watch him closely, but keep cool and show no signs of fear. Take him by the head, and speak to him in a firm voice, put on a strong bridle and curb, and order him to back. If he does not comply, give him a sharp cut on the fore-legs with the whip, and hold him firmly with the left hand, standing facing partly towards his rear, but with the head turned so you can see every movement of his eyes and ears. If the stall is not roomy and high do not attempt it. The struggle is better in a small close yard. If he rear cut him sharply again over the fore-legs while up, and if he kick cut him on the hind-legs near the body, but never more than one stroke at a time. When he ceases to resist, gentle him, and so proceed until the animal is entirely submissive to your will. If a horse has acquired vicious habits from having beaten a timid, or worse, brutal master, the case is more serious. Have nothing to do with him unless fully assured of your powers to subdue him.

To succeed he must be made to lie down; to do this confine him in a stall so close that he cannot turn round in it, and with the near side so

arranged that you can approach him sufficiently near to operate in any direction. If the horse will submit to fondling so much the better. Under no circumstances use a whip. The work must be done by showing the horse that his struggles are always against himself.

Have the side of the stall so arranged that it may be taken down and allow free egress to a yard thirty feet square, with a high board fence, or, better still, a large square barn floor covered a foot deep with straw tramped solid. Procure the following articles: a simple single-rein bridle, strong, and having a gag bit with large rings and long guards, the reins to be only sufficiently long so they will lie on the withers; have also a strong, padded surcingle, made with a two inch ring at the belly; also, one strap an inch and a quarter wide, and three feet or more in length, with a strong loop to form a slip noose, and a strong buckle on the end; and another strap five feet long with the end turned into a loop and firmly sewed; also two strong knee pads, to protect the knees in falling.

Put on the bridle, buckle on the knee pads, loop the short strap around the near fetlock of the fore-foot, raise the foot and buckle the end tightly around the arm of the fore-leg next the body, thus you have one foot firmly held up. Put the loop of the second or long strap about the fetlock of the off fore-leg, and pass the end of the strap through the ring of the surcingle under the horse. Do not be in a hurry, and in no case lose your temper. If it takes two hours, well and good, you have the horse then perfectly under command however vicious he may be.

See that there is entirely free egress out of the stable and let him go. Approach him slowly, but without hesitation, steadying him by the voice. If he show fight do not hesitate, he is on three legs and nearly powerless, except to bite, or to strike you in the act of rearing. Seize him by the near bridle rein about twelve inches from the bit, and placing yourself immediately at his near quarter, or just behind his shoulder, gather the long strap in the right hand and when the horse rears draw up the other leg.

If the horse struggles *let him do so.* It will not be necessary to exert much strength, simply tact and coolness in steering him. When he comes down it must necessarily be on his knees. If he continue to struggle let him exhaust himself. It will rarely take over five minutes, and never ten by the watch. Having him on his knees always seek to draw the head from you by pulling on the rein that comes over the neck. Once you have the head turned keep pulling on him until he gives up completely and lies down. Use no violence on the rein. It is only to be used to steer or guide the horse. It is the strap that does the work. However many attempts he may make to regain his liberty it will only end in the more complete discomfiture of the horse. Once down unless

a lies still hold his head still by sitting on it. When completely subdued, stroke his head, rub him on various parts of the body, soothe and caress him, and especially handle him wherever he is disposed to be touchy, being careful always to be on your guard, that if he resist he may be immediately checked.

Show him a buffalo robe, an umbrella, or anything he would be likely to frighten at, and *always* let him smell it until satisfied. Sit on his side, handle his feet, tap them, and at last remove the straps from his feet, and continue to fondle him. If he attempt to rise hold down his head firmly, and bend up one fore-leg. If he get the advantage do not struggle with him but let him rise to his feet again. Lay him down until he gives completely up. He will soon come to lie down quietly at the word, simply by tying up one foot, and at last will do so at your bidding without tying. When down and quiet pass your hand repeatedly over his body, breathe in his nostrils, gently open his mouth, give him soothing words, and when on his feet give him a taste of something he likes.

This is substantially Rarey's plan, and it may be practiced successfully on very vicious horses, as we have done. As a rule, however, the directions previously given will be found to be fully effectual in breaking colt

XII. How to Train to the Saddle.

No person should attempt to break a horse to the saddle unless he be a thorough horseman himself. It is not sufficient that he be able to stick on a horse's back with or without a saddle. He must be able to do so, and without aid from the bridle, when the horse is undergoing any of the movements likely to occur when on his feet. The bridle is used simply to steady a horse under certain circumstances, and as a signal to guide him. If the trainer be not able to ride thus, and with ease to himself and the horse, he has no business as a trainer.

Walking.—A fast walk is the most valuable of all the gaits of the horse. To walk rapidly is the first and most persistent of the lessons to be given. To teach a horse to walk fast the head must be kept moderately well up, and yet but little real weight should be borne on the bridle —only just enough to assist the swaying motion and nodding head always exhibited in fast walking. During the acquirement of this gait, no other should be allowed, and when the horse shows signs of fatigue, the lesson should end. In this, the seat of the rider is important, it should be easy and with sufficient grip of the limbs to steady the rider, and with play of the lower part of the legs to keep the horse well up to his work, and assist

in increasing the gait. Thus by care and practice almost any horse can be gotten up to four miles an hour and a really active one to five.

In breaking to walk fast to the wagon, there should be just sufficient bearing on the reins to steady the horse. The check-rein should be quite loose, for no horse can walk fast and easily with his head gagged back in an unnatural position. The horse, however, should be first trained to walk fast under the saddle, and by the means we have indicated. Then, when harnessed, he will not forget the lessons given, and may even be improved in his walk, if not already brought up to his maximum speed.

A naturally slow walking horse may be made to walk much faster; a fast walking horse may be greatly improved in his gait, but a lazy, slow dolt will never pay for any education beyond that of honestly pulling such a load as he may be able to comfortably move. For the saddle he is a nuisance, and no attempts whatever, should be made to bring him out as a riding horse. If a good one, however, bring out his walking powers. Like the trotter, he will improve until he is eight or ten years old.

How to Train to Trot.—Every farmer's boy thinks he knows how to drive a trotting horse to a wagon. Very few really do. Still fewer understand how to trot a horse under the saddle. If properly performed it is the least exhausting to the horse within the limit of his natural speed, and need not be unpleasant to the rider. That it is among the best and most pleasant exercise the horseman can take is without doubt.

Certain drivers have denied that the trot and the pace were natural to the horse. Every person who has been among the wild horses of the plains knows the contrary. It is a fact, however, that the trot is but a modification of the walk. There are two styles of motion for the rider; one the rising motion, by which the rider eases himself in the stirrups—not ungraceful when properly performed—the other where the rider keeps a close seat, supporting himself by the knees and stirrups. The elbows should be kept rather close to the side, and with only just enough bearing on the curb and snaffle to keep the horse's head correct and the animal under perfect command. In fact, under no circumstances is the rein and bit for any other use but to guide and steady the horse. The rider maintains his equilibrium, keeps his seat, and renders himself entirely at home in the saddle, through the science of equitation and the proper pressure of the limbs against the saddle. Until this is thoroughly accomplished, no person has any business trying to train a horse to saddle gaits. The rider must train himself first.

In the trot, when the rider rises in the stirrups, the snaffle-rein only should be used, a rein in each hand, and once grasped and properly arranged, the arms must be held rather close to the body, but without

clinging thereto. The feet should rest in the stirrup so the heel is well down, the leg from the knee down fully straight, and moving but little.

The rise and fall of the body must be as slight as possible, only sufficient to escape thumping, and to ease the horse. The head of the horse should be kept pretty well up, the limbs of the horse well under control. The rider will appear to support the horse with the bit. In fact, he does not. He simply holds the horse to his pace.

There is this difference between road riding and race riding: in riding for pleasure, the animal is never severely pushed, whatever the gait may be. In riding a trotting or running race, the animal must put forth all his powers, the only object being that he extend himself as much as possible, and without reference especially to the style of going. As a rule, race riders are disqualified for riding or trotting a horse gracefully on the road.

In trotting, always train the horse to slacken his pace and stop if desired, by slacking the rein, and at the word. In square trotting, the hoofs move in exact time, 1, 2, 3, 4. Some horses acquire a pace denoted by the time 1, 2. With this motion it is difficult to rise easily in the saddle, and it should not be allowed. To ease the horse's wind let him walk or canter slowly; or better, give him a jog trot. The jog trot, however, is under no circumstances to be allowed when traveling on the road in company. After a hard ride at any gait, it eases the tired horse immensely.

XIII. Training to Trot in Harness.

In trotting in harness the horse is more firmly held than when under the saddle, and for obvious reasons. Yet here a dead strong pull is to be avoided. The horse is simply to be supported and steadied by the bit. The driver must learn by his own study, and by observing others, how to do this. The bit must be adapted to the horse. A boring, hard mouthed brute could not be driven with comfort in a bit that would suit a sensitive mouth. Very many trotting drivers spoil their horses' mouths and make them pullers. The pull of a trotting horse should never be such as to tire the well trained muscles of the driver, even though it be a lady. Indeed, one of the best drivers we ever knew was a lady, and she was superior by the delicacy and yet firmness with which she handled the reins.

In training to trot in harness, the object should be to keep the horse squarely to his work, and at the top of his speed, without forcing him beyond it. In fact, no horse comes to his best trotting speed until he is at least eight years old.

Do not force him beyond his power, and above all do not rein him so

hard as to make him a borer. One of the best pair of road trotters we ever broke, were trained with curb bits, and when under smooth motion were apparently driven with a loose rein; such, however, was only apparent; they had been given such delicate mouths by careful driving that the least indication kept them in proper form. Below we give two illustrations: one showing a horse unduly checked and gagged back, the other with the head in an easy-going position. The use of the bearing rein is simply to keep the horse from getting his head too low, not to draw it back in an unnatural position. Under the saddle this is precisely the use of the curb.

HORSE'S HEAD WITH BEARING-REIN.

HORSE'S HEAD WITHOUT BEARING-REIN.

The Pacing Gait.—This is a gait natural to many horses, and exceedingly difficult to teach a horse that it is not natural to. On the other hand it is not difficult to make a trotter of a pacer. In pacing, a horse lifts both feet on a side simultaneously, and on perfectly smooth ground it may be made an exceedingly fast gait. It is easy to the rider but ungraceful in the extreme, from the fact that, as in sculling a boat, the body is swayed from side to side. If the horse has the pace naturally he should be trained to increase the pace by precisely the same general rules for increasing the trotting pace; by keeping him well in hand and inducing him by every possible means to increase his stride.

The rack, amble, and single foot, as it is sometimes called, are all but modifications of the pacing stride and the gallop, just as the jog-trot and the walk are modifications of the trot.

The amble is a slow, smooth gallop, or rather canter, and must be taught to the horse under the curb.

The rack is a modification of the pace, the feet instead of being lifted up simultaneously side by side, represented by the figures 1–2, may be represented by the figures 1–2, 3–4, that is, the feet are not lifted regularly as in the walk.

Single foot is a trained rack. It requires patience and time to teach, except in a horse having a natural adaptation thereto. Once the animal

catches the idea be sure to let him know that you appreciate it, and wish him to preserve it.

It is difficult to give written instrucitons, for rules which would accomplish the matter with one horse and rider, with another would totally fail. There is only this fixed rule: The horse must be in complete subjection to the will of the rider before anything but the natural gait is attempted. All these gaits, and the canter as well, are taught by using patience, keeping the feet of the animal well under him, and keeping him sufficiently well curbed so he cannot extend his stride until he fully understands what you want of him.

Changing the Leading Foot.—In developing any gait the horse should be made to start with either foot as desired. It should be one of the first lessons taught. To do this turn the horse's head somewhat by pulling the rein and pressing the heel slightly on the side opposite to the leg which it is desired to move. This will turn his head and croup slightly out of the proper line of progression, something that the horse naturally does when he starts. To change the leading leg, if, for instance, he is leading with the off fore-leg, rouse the horse, turn his head to the right, while the left heel reminds him to throw his croup out of line, upon which, by a peculiar motion the change is effected.

Galloping.—The gallop is often stated to be the fastest gait of the horse. This is however not strictly true. When a horse is going at the top of his speed under whip and spur, the whole animal is extended to the utmost, the head and tail straight out, and the animal going close to the ground. The slower he goes the more upright he holds himself, until when in the fashionable canter—the most distressing gait for the horse—he is almost on his haunches. All that is necessary to get the horse into the gait is to rouse him, give him a check for the leading foot, and restrain the gallop to the requirements of the case.

The hand gallop is an easy going pace, both for the horse and the rider, and may be said to be half speed. The gallop proper is such a gait as will exhaust the horse in going ten or twelve miles. Running is that gait which cannot be continued longer than from one to three miles without seriously distressing the horse. Being one of the natural gaits of the horse it is only necessary to rouse the lazy horse to the proper speed, or to check the ambitious one to the pace desired.

XIV. How to Train to Trot in Light Harness.

Trotting in light harness is generally considered to mean, being hitched to a light vehicle, either single or double and being driven for pleasure. Used in this manner horses may be driven either with the curb, the

snaffle, or other trotting bit according to the delicacy of the hand of the driver, or mouth of the horse. We prefer, after they are way wise and used to the curb, to drive them thus, until they have acquired the proper carriage, and this entirely without the bearing rein. The object accomplished in this is, the horse becomes entirely subservient to the driver but at the same time learns to rely on himself so far as sure-footedness is concerned. When he will go in proper form he may be driven with a trotting bit, until he has learned to extend himself fully, when he may again be placed in the curb, and if delicately handled will give satisfaction any where on the road. Thus trained under the curb, when used with a trotting bit, they may be made to exhibit all the style they are capable of at an ordinary gait, and may be shaken up instantly for a brush and extend themselves to the utmost.

In trotting at any speed the horse must be trained to take hold of the bit, so he may be steadied by the rein. He must never be allowed to suppose that this hold of the bit is for the purpose of pulling on. It is to be used simply to steady himself, and as a means of quick comprehension of the driver's wishes.

XV. How to Train for the Plow.

In training a team for plowing, they must be made to walk at such a pace as will lay the best furrow, to walk evenly and straight ahead, without pulling apart or crowding each other, to obey the slightest check of the driver in laying out lands, and at the end of the furrow to come immediately and quickly about. To this end the reins should be carefully adjusted, the whiffle trees should be as light as will suffice to do the work, and the team must never be over driven. In stony or grubby land they must be kept so completely under control, as never to spring forward when the plow strikes an obstruction.

In turning quartering about at the end, on square lands, in plowing right handed furrows, the near horse should back slightly, that the off horse may not step on his feet, and the traces should be kept slack enough so the plowman may easily enter the point of the plow in the next furrow.

In back furrowing, the section of the circle described must be that which will bring the plow, with the aid of the plowman, most easily to the next furrow, the off horse in this case, keeping slightly behind.

In plowing there is nothing gained by hurrying a team, and then stopping to rest. Plowing is hard work because it is a constant strain on particular sets of muscles. The team, however, may be very much eased

by the tact of the plowman in holding his team up in plowing through hard or tough places, by knowing that the harness fits perfectly, and by always having his plow clean and in a condition to scour.

In laying out land the team should be rather wider apart than when plowing furrow after furrow, or so the plowman may see the line stakes between the horses. In laying out lands always have the reins of such length that they may be carried over the left hand plow handle. Thus by taking the right hand rein a little beyond the center the hand may easily grasp the handle. A pull directly back will carry the horses *gee* and carrying the hand forward will tighten the near rein and carry the horses *haw*, while a steady bearing will keep the team in a direct line ahead.

The only position for the reins if carried otherwise than on the handle is to carry them just above the hips, and of such a length that when the team is going at ease they will be loose, and yet may be easily tightened by the plowman walking a little farther in the rear than usual. With a hard-mouthed team "feeling their oats" this will do. By the means we have indicated, if the lines are nicely adjusted, the team may be made to pull on the plow, and once used to this way of driving we have never known of its being abandoned, except for a time as a change. The practice of carrying a rein in each hand adopted by some good plowmen is not to be commended, except with a kind team. In this case to carry them over the left handle is easier, whether the team be wild or gentle. In any case the reins should never be carried over the neck. It is awkward, and the team is never under control. Carried over one shoulder and under one arm is an improvement upon this awkward plan.

XVI. Training to the Wagon.

But little need be said on this score if attention has been paid to what has been said previously. Upon good roads and with an ordinary load the team should be kept up to their maximum gait in walking. When the road is good in some places and bad in others, as country roads usually are, the load must be such as the team can move by hard pulling in the worst places. After a heavy pull always give the team a breathing spell, and in the middle of a pull if the team can start the load once stopped. This any honest team will do unless the bottom is miry, that is, unless from standing the team and wheels sink deeper and deeper. In this case, the only way is to keep going until firm ground is reached. The average driver is sure to hurry his team in the mud. They should be taught to pull steadily and slowly, and when started again, after rest-

ing, to take hold of the load steadily and with a growing impulse until it moves.

XVII. How to Train a Racer.

The training of racing stock, whether for running or trotting, is a fine art, and one which it would take a volume to properly describe in print. There are certain essentials, however, which are easily understood, and which every one who breeds stock for speed should know. The colt having been taught to gallop easily and naturally, should be put upon good sound oats and the cleanest hay. He should be carefully blanketed and groomed and his legs hand rubbed until fine. The exercise should be daily, upon a good course, and ridden under the direction of a horseman who is thoroughly up in his business. When this cannot be, the work must be done under the instruction of the master.

In race riding, the jockey throws about all his weight in the stirrups, steadying himself with the knees and thighs. The seat of the body is carried well back, the loin slightly arched, so the weight will not be brought too far forward, as the breech would be if the rider should stand straight in the stirrups. A jockey of ordinary weight will be found to carry his leg, from the knee, slightly thrown back; thus by stiffening his knee he can change his center of gravity without ceasing to stand in the stirrups.

Very light jockeys ride with longer stirrups, throwing their weight principally on their thighs, and with their breech raised entirely from the saddle, thus giving them a strong hold on the horse. Standing in the stirrup, however, cannot be long endured, and is only used for fast racing or galloping over bad ground, rough or deep, or in the case of a hill that must be passed quickly over.

Training to racing speed on the farm may be summed up as follows: a smooth track, regular feeding four times a day with the soundest of oats and hay, with a bran mash often enough to keep the bowels in regular condition; the most careful grooming, with plenty of hand rubbing of the legs; sweating exercise every day, and thorough cleaning afterwards; a trial gallop to extend the limbs, with an occasional spurt to note the increase of speed, and occasionally a fair trial at the distance which the horse is trained, to test his speed, powers of endurance, improvement, and capabilities.

XVIII. Training a Stallion.

The training of a stallion should commence from the time that it is intended to keep him as such, and certainly from the age of one year,

when colts are usually gelded. He should be exercised in a close yard, first at the end of the halter, and at length without bridle or halter rein, and made to advance, to back, to circle, to describe a figure eight, to rear and come down at the word of command, to kneel, to sit on his haunches, to lie down, and especially to come instantly to his keeper at the word of command.

All this takes time, but is labor well spent, for henceforth his usefulness as a sire, and escapes from accidents by being kicked, may depend upon his thorough training. Any observing person will have noted that in fully half the cases a stallion will be found dragging his keeper about like a puppet. All this may be avoided by proper care and training, so the horse will retain his full exhuberance of spirit, and yet be entirely under control.

His care and keeping should be of the best possible, and his daily exercise enough to keep his muscles firm, certainly not less than eight miles a day during the season of service. However well trained the stallion, when it comes to actual service, there is always a time when he may refuse to obey. Then he must be made to do so at whatever cost, and to accomplish the object, the whip must be used to any extent sufficient to conquer him. Cut sharp and strong, but with temperate judgment. Do not rain a succession of blows. This will only make him fight. A few well-directed blows will generally suffice, if they are sharp and cutting. Do not be afraid of drawing blood. If it can be done at the first stroke, so much the better. Give him time to think before you strike the second time. Give him the order you wish him to execute. If there is the least hesitation, strike again, and so on until he is conquered. If he has been properly trained previously, he will handle nearly as easy as a gelding. If not, he may become a brute, dangerous for any man to handle. Above all, a stallion once trained, never intrust him to an incompetent keeper, and never allow a valuable one to be ridden during the season of hard service. If he travels from one station to another, or is otherwise exercised, it should be with a leading rein, the rider being on another horse.

CHAPTER VII

HOW TO SHELTER.

I. COMFORTABLE SHELTER ECONOMICAL.——II. CONSIDERATION IN CONSTRUCTING STABLES. III. MANGERS AND RACKS.——IV. HOW TO INSURE A GOOD TEMPERATURE.——V. CLEANING THE STABLES.——VI. THE LOFT.——VII. THE HARNESS ROOM.——VIII. THE OUT SHED.——IX. WATER.

I. Comfortable Shelter Economical.

Although the horse is found wherever civilized man has made his home, and has been subjected by barbarian tribes wherever subsistence may be found Summer and Winter, yet in a wild state he is only found where the Winter and the Summer climate is mild enough to furnish herbage the year round. While it is true that the horse will stand weather as inclement as cattle, yet the owner who subjects either horses or cattle to the storms of Winter, not only makes no money from them, but deserves to lose them entirely. Thus the humane man always consults his best interests when he keeps his horse stock not only well fed but comfortably housed.

II. Considerations in Constructing Stables.

The first consideration in the construction of a stable is the number of horses to be kept. After this comes in economy of space in connection with convenience, ventilation in connection with the health of the horses,

and lastly the cost. In the construction of stables the question of warmth, convenience and ventilation are the prime integers, and whatever the character of the structure it must combine these three essentials, else it is a failure.

In the construction of stables the horse and carriage floor, including harness and tool room, and the loft, in which should be situated the bins for oats, shelled corn, corn in the ear, meal and bran, with suitable spouts and slides for delivering the feed on the lower floor, are all that is necessary. Every stable, however, should be supplied with a ventilating pipe placed about midway over one of the centre stalls. If there are more than four horses kept there should be two, and one in addition for each other four, but all connecting with the principal air shaft at the peak of the roof.

Where the horses are near the ground, and especially if the first story, or the walls of the whole building be of brick, there should be at least two courses above the ground laid in water-lime, to prevent the dampness from the ground ascending up the walls by capillary attraction. However the foundation be laid there must be perfect drainage, either natural or artifical, under the stable. Many valuable horses have been lost through inattention to this simple matter.

The size of the stable must of course correspond to the number of horses to be kept, and the number of vehicles to be sheltered. The width of the stalls should not be less than five feet each — six is better — and there should be at least one loose box in every stable, however small. If there are a number of breeding mares there should be one loose box to each four horses. These boxes should not be less than ten by twelve feet. Fourteen feet in depth for the stall is little enough. The travis or partition between stalls should not be less than six feet six inches long. If the stable is fourteen feet deep seven feet is better. It should be seven feet high at the head and five feet at the rear part.

III. Mangers and Racks.

The mangers and racks should be of the most substantial character, and, if expense is no object, of enameled iron, as to the mangers, and of iron as to the racks. If made of wood, oak or elm is a good material. However made there should be no rough edges to annoy the horses, nor splinters to wound. The top of the cap should not be less than three feet three inches from the floor, nor more than three feet six inches. The manger to be about thirteen inches wide at the top, nine inches at the bottom and eleven inches deep. The caps may be four inches deep and three inches wide, securely placed. The sides and bottom of the

manger may be of inch oak, or other hard wood. If made of pine they should be of inch and a half thickness.

IV. How to Insure a Good Temperature.

If the stable be of brick or stone, it may or may not be lined with wood with an air space between. If of wood, there should always be a lining, and the sheathing upon which the weather boarding is nailed should be covered with tarred paper. Ventilation must be attended to; this is best secured by orifices at proper distances next the ceiling, that may be opened or closed at pleasure, and provided with lattice work to throw the air up when opened. This with the doors and windows in Summer will give plenty of ventilation and in Winter the ventilators alone will suffice. It is one of the most essential points in building a stable in our American climate, with torrid Summers and Arctic Winters, that no expense be spared to make the buildings comfortable. We are decidedly in favor of a vestibule, large enough to hold a harnessed team, or if preferred, if the carriage room be large enough and separated by a close partition from the stable, as it should be, this may be made to do. From this the entrance to the stable may be a sliding door, through which to lead the horses; the object being to prevent the rush of cold air into the stable chilling every horse in it.

Where more than five horses are kept in a stable we advise a close partition between each four stalls and their accompanying loose box. The reason is, that in each compartment an equal temperature is retained. It is not so much the degree of cold that affects horses, as sudden changes of temperature. Thus each may have its separate ventilation and air shaft, and conduce very much to the comfort of the animals kept therein.

V. Cleaning the Stable.

Cleanliness in the stable is of the utmost importance. There should be sufficient bedding under the horses at all times to insure cleanliness; all damp portions together with the droppings should be removed twice a day. We have never found a better nor more economical way than to use a wheel barrow, with sides sufficiently wide and flaring to hold the load a man may handle, in which the manure and damp bedding could be thrown and wheeled on planks immediately to the pile. Where it is thrown out of windows it often heats so as to be offensive in Summer, and in Winter these windows, besides often allowing the wind and storm to beat in, are objectionable in many ways.

VI. The Loft.

We have already advised that the granary be in the loft, the shoots, however, should not enter the stable; first, because they create more or less dust, and second, they are liable to contract more or less effluvia from the stable. They should communicate with a room by itself, sufficiently large for sifting oats and mixing feed. The granary must also be made rat proof, which is best done by covering the bottom and two feet of the sides, and the top with sheet iron. The floor of the whole loft should also be covered with a tight floor of planks, plowed and grooved, so that by no possibility dust or trash can drop through; the loft should also be high enough to hold straw for bedding, and hay enough for at least two months' feed. In fact, if it be a farm barn, it were better to hold enough, if possible, for the Winter. This might detract somewhat from the architectural appearance of the building, unless the storage and stable room be large below. In any event we should not build any stable, however small, less than eight feet high, with a loft above of the same height, and in the case of a large building we should extend the loft to ten, twelve or fourteen feet as the size of the ground floor might allow.

VII. The Harness Room.

The harness room should be as complete as possible with suitable pegs for harness and seats or frames for saddles. It should also be provided with a saddler's horse for sewing straps, awls, needles, wax, thread, etc.; also a table for oiling harness, and if it have a boiler set in a stove for heating water, it will often be called in requisition in Winter, not only for its hot water facilities, but for drying harness and saddles as well

VIII. The Out Shed.

If the stable is provided with an out-shed for cleaning horses when the weather is not inclement, it will be found to save much dust and dirt inside. If this shed be a vestibule to the stable, with sliding windows, so much the better. It may even be used, in case of need, for temporary stables or for baiting a double team when it is not considered necessary to unharness. In fact there are many uses to which it may be put aside from the protection it would give the stable, in opening the doors in cold and inclement weather.

IX. The Surroundings.

Every stable should have a smooth, close yard, with a tight high fence

surrounding it, and if one side can be covered with a shed roof, fourteen feet wide, so much the better. This yard should be about 30 or 40 feet wide, and if it contains a place in the center of strong posts for a man to take shelter in from a vicious brute, it is not amiss. We once saw a life saved in this way, from an ugly bull, which broke from his fastenings and would have killed his keeper but for this safeguard. There should also be a grass lot near for cutting forage in Summer for soiling, and for turning in a sick horse occasionally.

X. Water.

The water supply is important. If taken from a well and pump it is absolutely essential that there be no contamination from the drainage of the stables and yards. If a tank can be so arranged that it will not freeze, build one by all means, and connect by pipes, pumping the water by means of a windmill. Or the tank may be situated where it will supply the house, and a pipe laid to the stable underground, ending in a penstock. In this case, the windmill and tank may be entirely isolated from the barn or house, and the water carried for any distance, provided the head is higher than the outflow.

CHAPTER VIII.

HOW TO FEED, WATER AND GROOM.

I. LAYING THE FOUNDATION. —II. WHAT TO FEED. —III. WHEN TO FEED. —IV. WATERING. —V. KINDS AND QUANTITIES OF FOOD TO BE GIVEN. —VI. HOW TO PREPARE THE FOOD. —VII. HOW TO MAKE MASHES, GRUELS AND HAY-TEA. —VIII. THE VALUE OF HAY AND STRAW. —IX. FEEDING GRAIN. —X. STABLE CARE AND GROOMING. —XI. THE TIME TO CLEAN. —XII. CARE OF THE FEET. —XIII. BLANKETING WHEN NECESSARY. —PROPER TOOLS FOR THE STABLE.

I. Laying the Foundation.

The feeding of horses must be either simple or complex according to the circumstances under which they are placed and the nature of the work required of them. It would, for instance, be as foolish with the farm or ordinary work horse to pamper with fire-warmed stables, highly stimulating food, and exquisite grooming, together with all the paraphernalia of blankets, hoods, bandages for the legs, and necessities of the trotting or racing stable, as it would be to allow this latter class to receive only the same care and attention usually bestowed upon the team kept solely for the plow and other drudgery of the farm. At the same time the extremes to which horses are subject, either on the farm or in racing stables, might well be modified in very many cases to the health and wel

being either of the farm horse or the pampered and high-bred racer. That is to say, racers are often "drawn down" too fine, and the ordinary work horse too often suffers from neglect. Thus in the first class we see a number of diseases seldom shown in the stables of horses with sufficient care, while the stables of horses carefully kept seldom suffer with the class of diseases found when horses are allowed to go dirty from day to day, and often from week to week.

To commence at the beginning, the breeder who would succeed with any class of horses, should see that the mare, while carrying the foal, has sufficient food and shelter, and that the foal itself is sufficiently nourished during the period of growth. Nothing is gained by insufficient shelter and food, whatever the use for which the animal is intended, and this brings us to the question of the food itself.

II. What to Feed.

In the West the feed of all horses of whatever class is oats, Indian corn, bran and hay. Whatever the work to be done, bran should always be kept, since a horse being off his feed, or slightly ailing from any cause not indicative of violent disease, bran mashes with good nursing will bring him out all right in nine cases out of ten. So, in the Winter when horses are confined to hard food, a bran-mash once a week should be given, and this generally on Sunday morning. On the farm there is nothing better than an occasional feed of roots—carrots, Swedish turnips, or mangel wurtzel—being valuable in the order named. If a peck of these could be given daily as an evening or noonday meal, the good effects of this feeding would be quickly shown. For the mares before foaling time, for the farm or draft horse, for the carriage horses of the citizen, and even for the fast driven roadster, or racer, when not being driven to exhaustive work, these will be found valuable.

The foal itself should be learned to eat roots as quickly as possible, and if the mare takes kindly to them it will not be a difficult matter for the foal to learn to eat them. As to the other food of the young colt or filly, oats alone with grass or hay, according to the season, should be allowed. In the Winter, half oats and half corn may be given with benefit, unless the young things are intended for racing or trotting, and are kept in warm stables; then Indian corn would not be desirable, as being too heating under the circumstances.

For the ordinary farm team, or other horses of slow work, Indian corn may be the main dependence in Winter, in connection with good hay; especially so if a few roots can be allowed as a portion of the daily provender. For fast working horses, sound oats and hay will be the

principal dependence, but in the Winter we have always given one-third of the weight of the daily grain ration in Indian corn, and we have always thought, with decided benefit.

III. When to Feed.

The importance of strict regularity in feeding is underestimated by nine-tenths of the ordinary feeders, and by fully one-half of the stablemen having the care of well bred horses. The horse, for whatever purpose he is used, if actively employed, should not get less than three feeds a day, besides the hay he eats during the night. All fast working horses should have four feeds a day. The hours of feeding are of prime importance. These should be, as closely as possible, at six in the morning, at noon, and at six at night, except at those pressing seasons of extra labor, when the morning feed may be an hour earlier and the evening feed an hour later. In this case, however, nose-bags should be carried to the field, or they should be turned to the wagon at 10 A. M. and at 4 P. M. to take one-third their usual allowance, as given morning and evening, which meals, as a rule, should be rather more than the noonday feed. When corn is the main dependence as feed these lunches should be of oats, and if bruised so much the better.

Fast working horses should receive their food four times a day, at six in the morning, at ten, at two, and at nine at night. Carriage horses should be fed the same number of times, the first feed being at six, and the last after their real work for the day is done, say at nine at night, since simply going to some place of amusement at eleven o'clock or later can hardly be called work. The mid-morning and afternoon meals will depend upon the hours at which they are generally used, nine A. M and 1 P. M. being the usual times for feeding.

IV. Watering.

Watering and the water used is of fully as much importance as the feeding. A horse is particular as to the water he drinks, but yet may be accustomed to any water without detriment if it be fit for human use. The water of large lakes, rivers and running brooks is best and in the order named. That of ponds without outlet or inlet the worst; in fact pond water should never be used; well water is altogether better and may be given without fear, when used constantly, but as with man, the horse accustomed to lake or river water, which is always partially soft, should be given well water, when necessity requires, with care and only in small quantities, the change being gradually made. Water should always be

offered before feeding, and never given in large drafts immediately after feeding; two to four quarts may be given with benefit immediately after dry feed, to properly moisten the stomach, and it may be freely given in two or three hours after feeding. When driving, water should be offered, especially in hot weather, at every stop, but only a few quarts should be taken at a time, for a heated horse, like a heated man, will take more than is good for him. Upon stopping, wash the horse's mouth with a sponge soaked in water, and let him swallow each time two or three light sips, just enough to moisten the throat, and upon starting give him four to six quarts each as the occasion seems to demand. Under no circumstances allow a heated horse to drink heartily. Farm teams and slow draft horses, at ordinary labor, may be allowed what they will naturally drink, but when heated the same rule must be observed as with hard driven horses. With these simple rules kept in view any intelligent owner or driver may keep his team fresh and without danger.

V. Kinds and Quantities of Food to be Given.

We have already spoken of the proper food to be given under ordinary circumstances; they are sound, whole grain, and bright, clean hay. Certain classes of horses, as omnibus horses, stage horses, car horses, and the draft horses of large mercantile firms in cities, are generally fed ground feed and cut hay. When the hours of feeding and rest may be estimated with accuracy, this is on the whole as conducive to the health of the animal as may be, when the economy of such feeding is considered, especially when we remember that in large cities a regular veterinary surgeon is employed, who visits the stables regularly to look after the well-being of the horses, and also where the superintendents and foremen are supposed to be experts.

On the farm, and in the stables of road-driving horsemen, and where carriage horses are kept, cut feed may very properly and economically form from one-third to one-half of the daily food given. When only one feed is given it should be in the morning; when two are given, they should be the morning and evening feeds.

As to the quantity to be given, no definite rule can be laid down. The horse must have a quantity fully sufficient to keep him well up to his work. Hard working horses may, if regularly fed, have what grain and hay they will eat clean, and in this case there is no better judge than the animal itself, except in the case of ravenous gluttons, sometimes found among horses as in the human family. Elaborate rules have been laid down by theorists, including a per cent. of grain according to the weight of the animal. In practice they will not work, since the labor, condition

of the animal, temperature of the season, and of stables must be considered. In the large omnibus stables where all the work is to be got out of horses that they can endure, from ten to fourteen pounds of cut hay per day are given, with from eighteen to twenty pounds of corn meal. Mix into provender, and on it they will go from eighteen to twenty miles each day. With this about three pounds of salt may be allowed each month. Some stable men do not feed more than one pound, arguing that a large quantity produces profuse staling; others feed up to four. In times of extra severe labor the cornmeal is increased by about three pounds. It would be better if the three pounds of meal where omitted and one extra feed of six quarts of whole oats be substituted, and given daily. The average livery horse may be kept in good condition on twelve pounds of hay and eight pounds of cornmeal daily, to be given at two feeds with the addition of six quarts of oats at noon, eight pounds of hay to be fed cut, with the meal, and four pounds from the manger. This same feed would do for ordinary farm horses at usual work, or if the grain is fed whole, five quarts of shelled corn, or its equivalent in ears, and six quarts of oats, with what hay will be eaten should keep the animal in working condition.

VI. How to Prepare the Food.

In preparing chopped feed, half the hay to be used, or clean, bright, long straw cut into about three-quarters to one inch lengths, should be put into the mixing trough half an hour before it is to be mixed, and thoroughly moistened. On this throw the meal, mill-feed, or whatever article is to be used, and moisten it. Then cover with sufficient hay to make the mess for the desired number of horses, weighing both hay and meal. Let it stand until feeding time, when the whole should be worked over and over until thoroughly mixed. If salt is given with the mess, put in the required quantity for each horse, from one-quarter to half an ounce per horse each feed. Many stablemen mix the mess half a day in advance, but this we do not like. Horses, like men, like their food fresh. An iron box is best for mixing, and it should be thoroughly cleaned after each meal.

VII. How to Make Mashes, Gruel and Hay-tea.

The ordinary sweet mash, as usually made, is to take four quarts of good bran, moisten it gradually with hot water, and then mix with what boiling water will bring it up to the proper consistency for eating, covering it with a cloth and feeding either warm if the animal will eat it

or else cold. What salt will lie on a quarter dollar may or may not be mixed with it.

A better mash, especially for dry fed horses, is to boil two quarts of oats and a pint of linseed, for each horse, for about three hours, and then mix with it sufficient bran to bring it to a proper consistency. Cover with a cloth and feed cold. Such a mash given once a week, if the horses are on average feed, will keep their bowels in condition. If off their feed, add a little salt and a half pint of molasses.

GRUEL is one of the best possible things for a beaten out horse. Stir gradually in a gallon of water, a pint or a quart of oat-meal, or half flour and half corn-meal, according as the horse likes it thick or thin, and fill up the pail with cold water. If the horse hesitates about drinking it, give him first a mouthful of water. If he be very tired a quart of sound ale will do him good, but under *no circumstances*, when exhausted, should he be given a feed either of grain or hay. If the horse will take nothing else, turn down a bottle of sound ale, rub him until dry and refreshed, and then feed.

HAY TEA is also a good stimulant. To make it—fill a bucket three-quarters full of bright, clean hay, pour over it enough boiling water to fill the pail, and cover tight, to keep in the steam. Press the hay down occasionally, let it stand fifteen minutes, turn off, and add water enough to make a bucket three-quarters full. Give to the horse when the liquid is cool enough to drink.

VIII. The Value of Hay and Straw.

In the feeding of horses the principal use of hay is to distend the stomach. For this reason lean horses, and those just off the pasture on coarse feed, require more than those which are regularly stabled and groomed. The change to grain must not be too sudden, else indigestion is apt to set in. Once a horse is used to full rations of grain, if oats are used, or corn meal and bran, he may get along daily with from six to eight pounds of hay a day. The hay, however, must be of the very best, bright, clean and free from dust. There is no economy in feeding bad hay. It is the cause of heaves, broken wind and other diseases produced by indigestion. Good clean straw is altogether better than poor hay. Straw is altogether the best material for bedding, and should always be used when it can be had. In the West it is plenty, and yet not one farmer in ten uses it for bedding in sufficient quantity or renews it often enough.

IX. Feeding Grain.

The most economical way of feeding grain on the farm is in its whole state. Oats and corn should be shaken in a sieve with a mesh so small that it will not go through, all dust and light matter blown away, and all stones, bits of iron or wire, carefully picked out. It will pay the farmer to do this as well as any other stable man. In feeding corn allow one-half the measure of shelled corn that would be deemed sufficient of oats, since corn weighs about double that of oats. If corn in the ear is fed, one-third more by measure heaped should be allowed than when shelled grain is used. In other words the stable must use seventy pounds of ear corn when fifty-six of shelled corn would be given, or 112 pounds of oats.

Some horses eat their grain better for being moistened. If so, moisten it, but as a rule we like to feed whole grain dry, since the horse is obliged to grind it better to get it in condition for swallowing. Horses with bad teeth always bolt their food whole. All such horses, and also aged ones, should be fed cut hay and ground feed.

X. Stable Care and Training.

The importance of steadiness and care in the management of the stable and in the cleaning of horses cannot be over-estimated. A brutal stable-man, or one which a horse fears, should be immediately discharged. There is indeed now and then a horse that requires to be kept in terror. These of course are exceptions. The competent stable-man should use neither fear nor brutality. Not half the so-called strappers (cleaners) are fit to be about a horse.

Many stable-men imagine the curry comb is an instrument for cleaning the legs and body of the horse. It is an instrument for cleaning the brush and for loosening the scurf on the fleshy—not bony—parts of the body. In using the curry comb, do so lightly, carrying it in circles rather than in straight lines. Use a wisp of hay for rubbing the dust from the legs, and a corn cob for the fetlocks, finishing with the brush. In brushing, do so thoroughly, with firm, long strokes, where possible, being careful in working about the head and bony parts. Clean the brush often by passing it over the teeth of the curry comb. When the scurf and dust are thoroughly cleaned out, go over the horse with a damp wisp of hay, and finish with dry cloths, being particular to get any particles of dirt out of the fetlocks, the ears, about the head, next the tail, below the thighs, under the jaws, and between the fore-legs. A horse

thus cleaned, whether he belongs to the farm or the city stable will not occasion shame on the part of the owner.

It is a question among horsemen, whether when a team comes in wet and muddy at night, it is proper to wash them. We have never found advantage in so doing. Clothe them warmly, bandage the legs loosely, and when dry, clean them, at least so far as removing the dirt, and getting up a glow at the surface is concerned. Thus handled, horses will seldom be found liable to surfeit, scratches, grease, and other diseases induced by checking the natural perspiration.

XI. The Time to Clean.

Clean when the horse is dirty. Always once a day when the horse is kept in the stable. Horses that run in the fields in Summer, or in the shed yard in Winter require no cleaning. Nature provides a natural scurf that defends them from the changes of the weather. Before work horses are littered down for the night they should be again thoroughly cleaned if necessary. As, for instance, if the animal has been on the road or in the field; it is important and will lighten the morning cleaning, apart from real necessity of the case.

Whenever the horse comes into the stable from the plow or wagon, for the day, he should be thoroughly cleaned *when dry enough*, and if sweating or otherwise wet should be thoroughly scraped at once. The scraper is a thin, flexible piece of wood; a section of barrel hoop makes a good one. In any event a horse once in the stable, clean him thoroughly, unless he be taken out again after being "baited." If he remain in the stable long enough for the operation, clean him especially as to the limbs, and if there is time, as to the body. It may seem like a good deal of work, but it will pay.

XII. Care of the Feet.

The feet are half the horse, in fact a horse with bad feet, is as near a worthless animal as possible. Attention to the feet is therefore of the first importance. In this connection shoeing is to be attended to. Know that the blacksmith understands his business. There are as many ignorant botch-workmen in cities as in the country. The horse's foot should be a study, and every horseman should understand the anatomy of the foot; this will be given in its proper place. How to *care* for the feet is in place here. When the horse is brought in from work, each foot should be lifted, cleaned, and examined with the picker to see that no gravel or other hard substance has found lodgment between the shoe and hoof, or

about the frog. Examine the frog to see that no substance is wedged therein, and that no nail or other sharp object has pierced the sole. If the hoofs are inclined to be hard and dry, fill them with a mixture of cow-dung and clay, or with oakum saturated with tar and petroleum. Watch them for contraction of the hoof, caused by allowing the shoe to remain on too long, or from bad shoeing. If the frog gets torn and ragged, cut the ragged edges but leave the frog intact. If the hoof be found pierced with a nail, and you are not perfectly sure you have pulled out every bit, cut it out at whatever labor it may be to you, or pain to the animal. Then dress the wound with a pledget of tow saturated with tar. If the hoofs are inclined to be hard and brittle, oil them occasionally, or let the horse stand, say for an hour or two, or for a half day on Sunday, in a box of soft clay and cow-manure, coming prettywell up the hoofs. Thus by the exercise of care and judgment you may keep the feet, what they ought to be, the better part of the horse.

XIII. Blanketing—When Necessary.

A blanket is always necessary when the horse is standing in the stable in Winter. A light sheet is about as necessary in Summer, during fly time. A blanket should always be thrown over the horse in cold weather, or even in the cool weather of Spring and Autumn, when standing after being driven. A horse should always be blanketed when standing in a draft, or in the rain, using a cloth or rubber blanket as the case may be.

In blanketing a horse, see that the blanket is sufficiently large to cover the animal from the neck to the tail, see also that the breast flaps are sufficient to protect this sensitive part, and that the blanket is large enough to cover the sides and flank fully. If not, do not buy it at any price. Buy a blanket for each horse, and having them use them when necessary, buckling them on so they will stay. Very many stable-men have a number of blankets for each horse; this is well enough if they can afford it, but one blanket to each horse, with enough in reserve so a dry blanket may be had as occasion requires, and with a good surcingle to each blanket, is all that is really necessary.

XIV. Proper Tools for the Stable.

The tools necessary for cleaning a horse properly may be very few or many. As a rule any horse may be properly cleaned with a scraper, a curry comb, a brush, a sponge, a comb, a wisp of straw, and a rubbing cloth. Horse pails both for washing the horse and for watering are indispensable to any stable but never use one for the other. These should

be of oak, half an inch thick, and with strong iron bails, and to hold fourteen quarts. The set of cleaning tools should be provided for every two horses. Every stable should have two manure forks, one of steel and one of wood, splint broom, a scoop shovel, and a wheel-barrow. With these any stable may be kept clean, and if the eye of the master is kept on the help, the horses will not suffer for want of care. And these essentials to a stable, and the treatment suggested, are urged on the score of economy. They *pay*. We also urge them from humane considerations, and those of neatness and system. In all respects kindness and attention to a horse are both satisfactory and remunerative.

CHAPTER IX.

BENEFITS OF KIND AND CAREFUL TREATMENT.

I. ABUSING A FAITHFUL SERVANT.——II. WHAT ARE BARBARITIES.——III. A PICTURE FROM LIFE.——IV. THE OTHER SIDE.——V. A GOOD FARMER'S SURROUNDINGS.——VI. FARMER UNTHRIFT'S BARN.——VII. HIS HOME.——VIII. THE CAREFUL MAN'S THEORY.——IX. USING THE MEANS WE HAVE.——X. AN INFALLIBLE RULE.

I. Abusing a Faithful Servant

The horse is the most useful servant of man, as he is one of the most noble of animals. He is fortunate if he falls into the hands of a kind and considerate master. Fully one-half of the horses used in civilized countries are driven by persons brutal in their temper and instincts, who, coming into possession of a horse suffering from disability, inflicted by some former owner, or perhaps reduced in value by age, are sold for a song, and thereafter the poor tortured brutes wear out a most miserable existence, until at length they drop in their tracks, literally driven to death. This picture is not overdrawn. Go into any of our cities, and on to many of the farms of the land, and see animals in every stage of incurable disorders. On farms horses disabled for city use in the possession of some renter, whose only aim seems to be to see how soon and on how little food he can wear out the miserable animal. Contrast these with the horses that are carefully fed and cared for, and by actual count the result will be surprising even to a veterinarian.

As a rule, the horses of the better class of farmers fare the best. They are not pampered, it is true, neither are they overdriven or overworked. If they remain on the farm, they are capable of full work until they are

twenty years old. How many arrive at this age? Not one in fifty. The most of them die under seven years of age.

II. What Are Barbarities.

Their name is legion. It is barbarous to overload or overdrive animals; to give them insufficient food and water; to allow them to stand

THE TEAM OF THE CRUEL AND IMPROVIDENT MASTER, AND THE USUAL SURROUNDINGS

day after day uncleaned and in filth, denying them even the poor boon of cleaning themselves; to work them during the progress of spavin or ring-bone, navicular disease, with corns, gravel, or other painful ailments of

the foot; to let them stand shivering in the cold, or in apologies for stables, in inclement weather without blankets; to drive them in the mud and mire and neglect to clean them; to ride them under torturing saddles, or to drive them in galling collars and harness; to use badly fitting

THE TEAM OF THE KIND AND CAREFUL MASTER, AND THE NATURAL SURROUNDINGS.

or torturing bits, and then jerk their tender mouths because their agony will not allow them to carry their heads directly in line or go straight ahead; to ride or drive through deep mud at a pace which quickly exhausts the animal, and then beat with a loaded whip, because they flag, or spur them until their sides are a gore of blood; to keep the poor

creatures in terror, from fear of the whip, and then beat with renewed vigor because the innocent brute does not comprehend what the master really does not know himself; to give the faithful servant over to the tender mercies of some man who calls himself a blacksmith, who either pricks him with a nail, pares down the hoof and the frog to the quick, and then because the poor animal cringes, holds back or perhaps stumbles, beats him for it. Such are a few of the more common of the cruelties inflicted, and which may be seen day by day by any who will notice. A man cannot pass along the streets in any large city, on any day, without seeing some of these things.

The observing man need not travel far in the country to see some such picture as we present of the farmer who believes in letting his stock shift for themselves when not at work, and is careful not to over-feed when they struggle with the plow or wagon.

III. A Picture from Life.

But, say some readers, the picture on page 146 is a fancy sketch. Not at all. It is drawn from life. The superannuated, rat-tailed horse, with one ear gone, blind, spavined, ill kept and ill fed; the mule, still more rat-tailed than the horse, intact only as to his ears, the broken-down fence, the edge of the marshy pond, serving as a wallowing place for hogs, and as a watering place for the family and stock; the dilapidated stable; the log cabin—all are true to life. There is but one redeeming feature in the whole scene: the wife begging that a little land may be left in front of the house unplowed. Will it be granted? Not so. The ragged edged plow will cut as close to the corner of the cabin as possible, and then bear off in a circle in the near distance beyond. Land is too valuable to spare any next the house, but the weeds and dilapidated fence tell a tale of plenty of land beyond. If the traveler chose he might learn the cause of all this. A history made in the corner grocery of the village, over the broken bridge.

Contrast this with the companion picture we give on page 147, and which tells a very different tale.

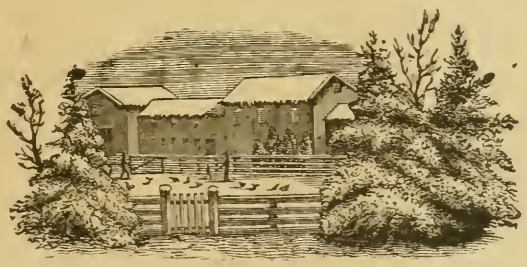
IV. The Other Side.

It is of the farmer who is well-to-do by his own tact and energy. His team is trained to almost human intelligence. Strong, able horses, whose dams were kindly worked and carefully fed. When foals they were early taught to take their oats. In Winter they were carefully housed, their training commencing within a few days of their birth; broken in at two

years old, worked gently, and at three past given full liberty again until four. They are now six years old, trained to go without lines, a gray and a bay; well bred; weighing 1250 each; capable of going a mile in four minutes to the farm wagon. How much think you they are worth? Let us whisper it; $800 has been refused. A foolish farmer is he not, to keep so much money in a *farm team?* Perhaps not. He asks $1200, and he will get it. He has fulfilled the conditions we have given as to breeding, feeding, watering, care, shelter, breaking and training. They have lacked for nothing he could give them, and in turn refuse nothing they may be able to do for him.

V. A Good Farmer's Surroundings.

The surroundings of a man in any condition in life, whether he be rich or poor, are an index to his character The animus of all men is to make money, but some possess in connection, a love of the beautiful. Without method in labor no man can be successful. The farmer who has method, and an eye for the beautiful, and only comfortably well off, perhaps, will show his barn yards and surroundings something like the following illustration:



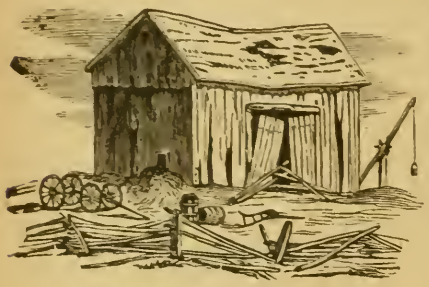
THE BARN OF THE PROVIDENT MASTER.

His barns are tight and ample, and filled to the ridge-pole with fodder His yards are protected with shelter-belts and wind-breaks. his pastures and meadows ample and luxuriant, and his crops well tilled and heavy. Inside his barns will be found a place for everything and everything in its place.

VI. Farmer Unthrift's Barn.

On the other hand we give a view of the barn of the improvident master His well, simply a hole in the ground where the drainage of the yard may enter, the roof of the hovel rent and torn, the delapidated doors propped

up with rails, the weather-boards fallen or falling off, and the whole thing shaky, like the master's mind. Fine stock, fat, and well groomed, have come out of hovels of barns; they were made warm and comfortable. It is not the most expensive structures that always contain the best stock, but in the end the better barn will be built. We have never seen good stock issue from such a barn as we have shown, and it only needs to show the house the farmer lives in, with its brush heap, its line of ragged clothes, the ragged, dirty children, and generally dilapidated appearance, to complete the pictorial story of general unthrift



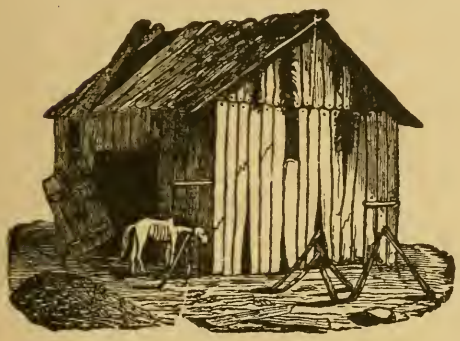
FARMER UNTHRIFT'S BARN.

VII. Farmer Unthrift's Home.

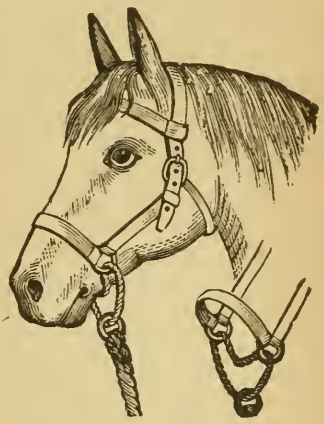
FARMER UNTHRIFT'S HOME.

Such a man will raise his colts from spavined and broken down mares, they will shift for themselves upon scanty pasture in Summer, and in the brush in Winter. He believes in hardening his stock, and he does it; hardens them into "runts," not worth a month's keeping. They are literally broken to work, broken in body and temper with cruel blows; they are halter-broken too, the halter is a rope knotted about the neck, like the poor old horse shown on next page, tied outside the barn for the benefit of the fresh air it may get; a starved out skeleton horse, contemplating the skeleton of a barn. Even in such a barn there are capabilities that may be utilized for comfort. It may be reshingled, and new clapboarded, and the doors hung on their hinges. It may even be patched up so as not to leak, and be banked up to keep out the cold. But will it

be? Hardly! The picture of the old house, the wreck of a horse, the old rope around the neck, the rotten barn, all tell of more money spent at the dram-shop than for the maintenance and comfort of the family or the well-being of the stock.



THE BARN OF THE CRUEL MASTER.



A MODEL HALTER ON A MODEL COLT.

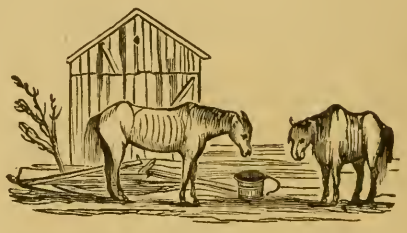
VIII. The Careful Man's Theory.

As an accompaniment to this we give an illustration of a well-kept colt in a model halter for unbroken horses. By slipping both ends of the chin strap through the ring of the tying rope, it is a halter for a well broken horse. The man who possesses such stock and fixtures may not be rich; probably is not, but he is a careful, thinking, reading, methodical man, who believes in doing everything well. He uses no cruel bridles, gives his colts no excuse for getting cast in their halters. His harness seldom galls the team, and when it does, it is remedied at the first indication. However dirty his team goes into the stable, it always comes out clean and blooming; not only this, such a master never finally leaves his team for the night, after a hard day's labor, until it is dry, well groomed, well littered down, and in every way comfortable for the night. In the morning his team are always ready for the field or road; and however eager or spirited they may be, will travel along together, either ahead of or behind the master, and looking like the picture that we here give on following page—a lordly team, that only could belong to a kind and considerate master.

They are not too many. The cruel, or shiftless, or drunken masters are plenty enough. The farm stock of many get barely enough to eat, and that in an irregular and improvident kind of way. They never pull very heavy loads, the master has not many to haul, and he believes in

skim plowing. When he comes home, he "runs them into the barn," such as it is; or they take the yard for it, and in the morning very closely resemble the picture on the left.

TEAM OF THE KIND MASTER.



TEAM OF THE CRUEL MASTER.

A "humped up," hungry, thirsty pair of servants to a cruel, because improvident master.

Such a man may not be cruel in the sense of beating. He may be really a kind-hearted man, a good neighbor, "thoroughly honest, as the world goes," he may even be a good Christian man, or *think* so at least. He is cruel nevertheless. More cruel perhaps than the brute who belabors his beasts and then repents. Cruel in his improvidence, in his neglect of his farm and his stock.

HIS DOOR-YARD GATE.

HIS FIELD-GATE

Is it any wonder that in the morning the team should be found in the yard, waiting for their breakfast. The wonder is that there should be anything, either in the house or out for either man or beast to breakfast on.

If to neglect we add a cruel or brutal disposition, the animals of the farm are to be pitied, and the household likewise pitied, and prayed for.

This chapter is pictorial, and not particularly given to practical information on the care of horses. It is a chapter of contrasts, and given deliberately, as indicating far more eloquently than mere words can, the difference between careful and kind treatment of stock, and cruel or

neglectful treatment. It is, in fact, the story of thrift and unthrift. We expect few whom it might benefit will see it. The unthrifty man whom we have depicted, seldom sees books, and we might almost say, never buys one. Those however who do, may perform good missionary work among the class we have represented, by showing them how quickly thrift will follow good intentions, religiously kept, backed up by honest industry, guided by careful judgment, and accompanied by a will to perform. It will repair houses and barns, build gates and fences, cultivate smiling fields, rear and train good stock, lift the mortgage off the farm, educate the growing family, and bring comfort and happiness to a once cheerless and suffering family.

IX. Using the Means We Have.

In the foregoing, it is not to be understood that expensive appearances are necessary for training a horse, neither is it to be understood that costly buildings are necessary. We have stated more than once that any farm animal may be kept in the most comfortable manner, in a structure made of poles and hay, and we will add, kept in as good health as in expensive stables. The reason is that the master who uses care in making a simple structure warm and comfortable has humanity to start with, and generally gives his own personal care and supervision, while in costly stables the animals are usually left to the care of men hired for the purpose. The owner, often, from the pressure of other business pursuits, being unable to do more than to drive a favorite animal or team. In perhaps a majority of cases he knows little or nothing of how a horse should be cared for, and of course nothing as to the fitness of those whom he pays for doing the work.

The object of this work is to present in a condensed form the best practices, founded upon common sense, and the experience of superior stockmen in the care of animals. A study of these pages will enable any person to acquire a good idea of the simplest and best means for arriving at a correct knowledge of how animals should be bred, raised, fed, trained, and cared for. He may thus understand how to do the work himself, or, in case he be a man of business, or wealth and leisure, he may quickly know whether the help he relies on are doing their duty, not only in feeding and cleaning, in exercising and the general care of the animals under them, but also know at a glance, whether the animals are treated with the kindness and consideration that dumb brutes, but faithful servants, deserve from man. The closest and most constant attention to these points will abundantly pay every farmer, and every wise farmer will be certain to bestow such care.

X. An Infallible Rule.

We have known a brutal stable-man to flog a horse in the most terrible manner, simply to get rid of his own ugliness, as he expressed it, while at ordinary times he petted and made much of the animal. Such an animal will be frantic at the sight of a whip held in a threatening manner. Animals that are in the habit of being struck with the pitchfork, or being kicked and cuffed, will watch carefully the stable-man, and show by their nervousness in the stable what they are expecting, while of the master they will show no sign of fear. Stable-men are often cunning creatures; they will have soothing words to quiet the animal in the presence of the master. We have always held that the horse should be spoken to firmly but quietly, and always have an inherent suspicion that a team exhibiting signs of fear at times, where we always hear the keeper speaking to them in soothing tones, are abused in secret.

No sane man would practice such treatment to his own stock, and no man who is obliged to leave valuable animals in the care of servants should fail to know that they are doing their duty. It is not enough that the stable-men feed the regular rations, that they clean and exercise properly. It should be made important that in all their intercourse with the animals under their care, they be not unduly punished, nor in any other respect abused.

CHAPTER X.

HOW TO BUY.

I. HOW TO GET CORRECT INFORMATION.——II. THE BUYER MUST KNOW WHAT HE WANTS.——III. PROPORTIONS OF THE HORSE.——IV. THE CLEVELAND BAY FOR PROFIT.——V. THE LIGHT HARNESS HORSE.——VI. SADDLE HORSES OF ALL GAITS.——VII. THE HIGH-BRED HUNTING HORSE.——VIII. RACING HORSES.——IX. WHAT THE RACER SHOULD BE.——X. TO AVOID VICES AND DEFECTS—HOW TO DETECT.——XI. OTHER FAULTS AND IMPERFECTIONS.

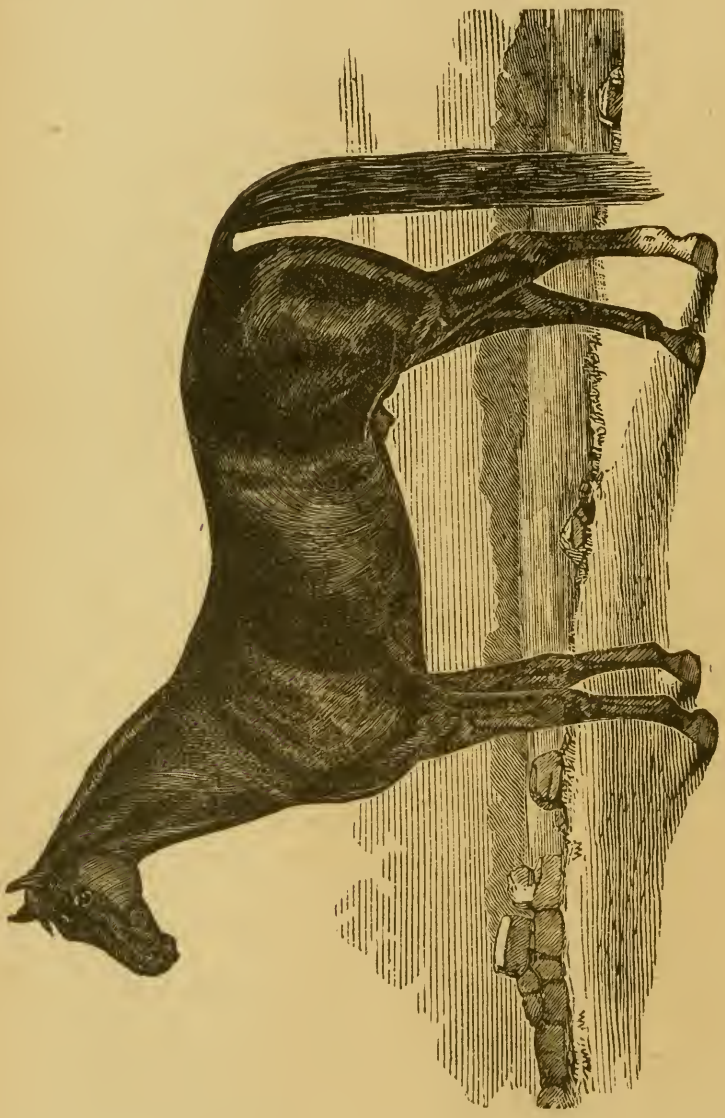
I. How to Get Correct Information.

Every horse owner sooner or later becomes a judge of what he is buying. If he depends entirely upon the lessons learned through cheats that are practiced upon him by sharp jockeys, life is too short for him ever to become an adept in distinguishing vice, unsoundness, "dosed up" and used up horses as among the various tricks and swindles practiced upon the ignorant and unwary. Generally after being cheated, or absolutely swindled a few times, the breeder goes to the only correct source of information, concisely written and carefully illustrated books. He is thus enabled not only to study, but subsequently to carry in his mind what he has read and seen; he comes to compare critically the living animal with the illustrations and descriptions, and thus becomes an expert himself, and in a hundredth part of the time by which he could acquire correct information in any other way. This is precisely the means used by any professional man in the acquisition of true knowledge in the pursuit of his profession, whether it be in a learned profession or in the education to practical art. Thereafter practice makes perfect.

II. The Buyer Must Know What he Wants.

Suppose he is looking for stock from which to breed trotting horses. He must then consider the type of horse he wishes to breed; whether for

speed alone, or for style and speed. That is, first class road horses, or large, strong, able horses, combining in as great a degree as may be large size, strength, endurance and such style as may be conformable with this class of horses.



HIGH-BRED ROADSTER.

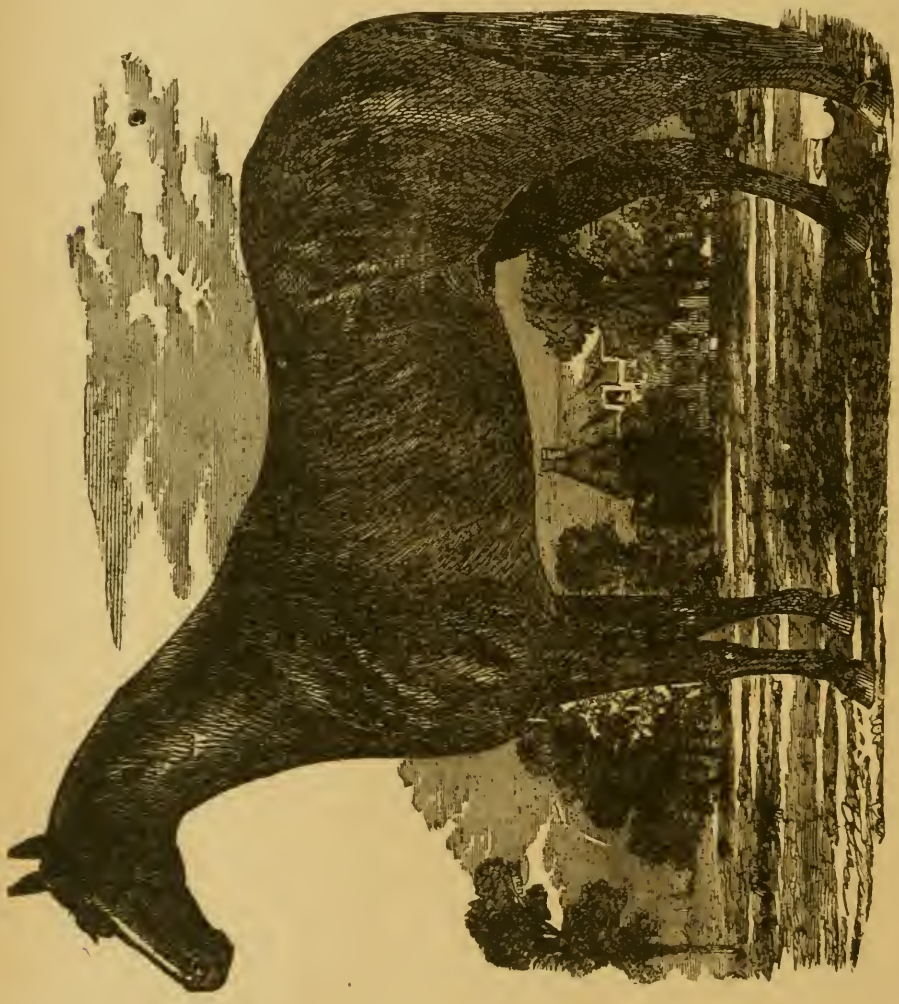
As showing what may be done in colts got by breeding up out of roomy mares of fair style, bred to high class trotting stallions, we give three cuts of stallions, certainly good enough for sires, and as models of what such horses should be. The first showing eminent breeding, with

style enough; rather straight on his fetlocks, according to the idea of many good horsemen, but with length enough, from our standpoint, to give flexibility. A horse compact and smooth, with excellent flat and

FINELY-BRED ROADSTER.

sinewy limbs, good feet, ample chest, good lungs, fine eye, broad forehead, and strong jaws. The head not the ideal of modern "blood horsemen," but nevertheless showing docility and intelligence in a high degree. Showing also high breeding in every part.

The cut on page 157 is of a horse of great style and endurance, fine all over. A horse that will go with his head well up: limbs exceedingly fine, mane rather light, but with plenty of tail, as a horse should have; evidently showing Morgan blood, dashed with Bell Founder and other thorough blood.



A GOOD FAMILY HORSE.

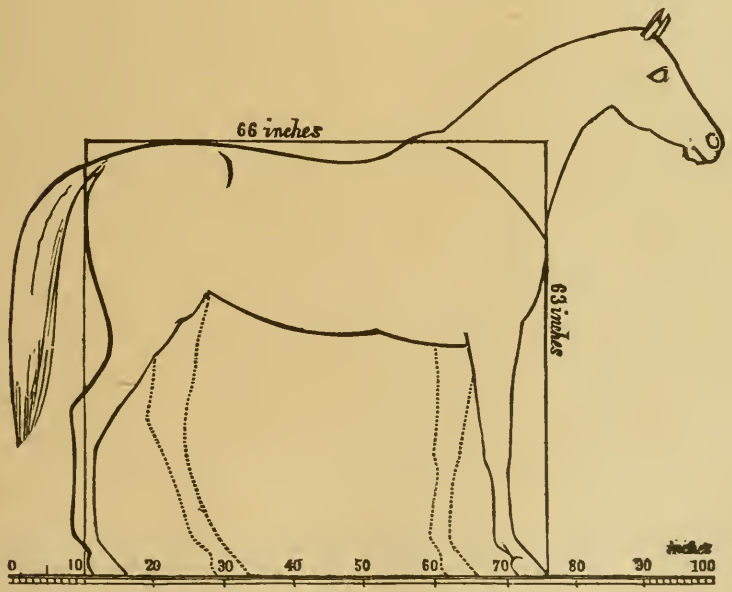
Between the two, for real and intrinsic merit, the first should be taken. There is plenty of style about him, and strength. There is also a body of fine character on limbs of great power. Such will be found acceptable and sought after always by gentlemen wanting a single horse, or a pair for driving on the road, or for driving in the city park-ways in the

afternoon. Either of the two will make capital and stylish saddle horses, if well trained, such as no gentleman of ordinary weight or any lady need be ashamed of when taking the afternoon trot or canter on the fashionable boulevards or park-drives of our large cities, or on the streets or roadings of cities having no parks. The first the best horse, the second the most stylish.

The third cut we give is that of a horse of large size and strong build, adapted for drawing as a single horse for the coupe, or one of a team to the family carriage; as one of a pair for a coach or barouche; one that will give satisfaction almost anywhere, if not driven over eight miles an hour, and capable as well of hauling loads on good roads, at a fast walking pace.

A horse of this stamp, sixteen to sixteen and a half hands high, not particularly heavy set, rather long-limbed, with rangy neck and good head, with plenty of spirit, and weighing about 1200 pounds, may be called a *general utility horse*. Such will command ready sale at any time, if well broken and trained, say at from $200 to $300 each, and if particularly nice and well matched, often at $800 or $900 the pair, as carriage horses when five or six years old.

III. Proportions of the Horse.



PROPORTIONS OF THE VARIOUS PARTS.

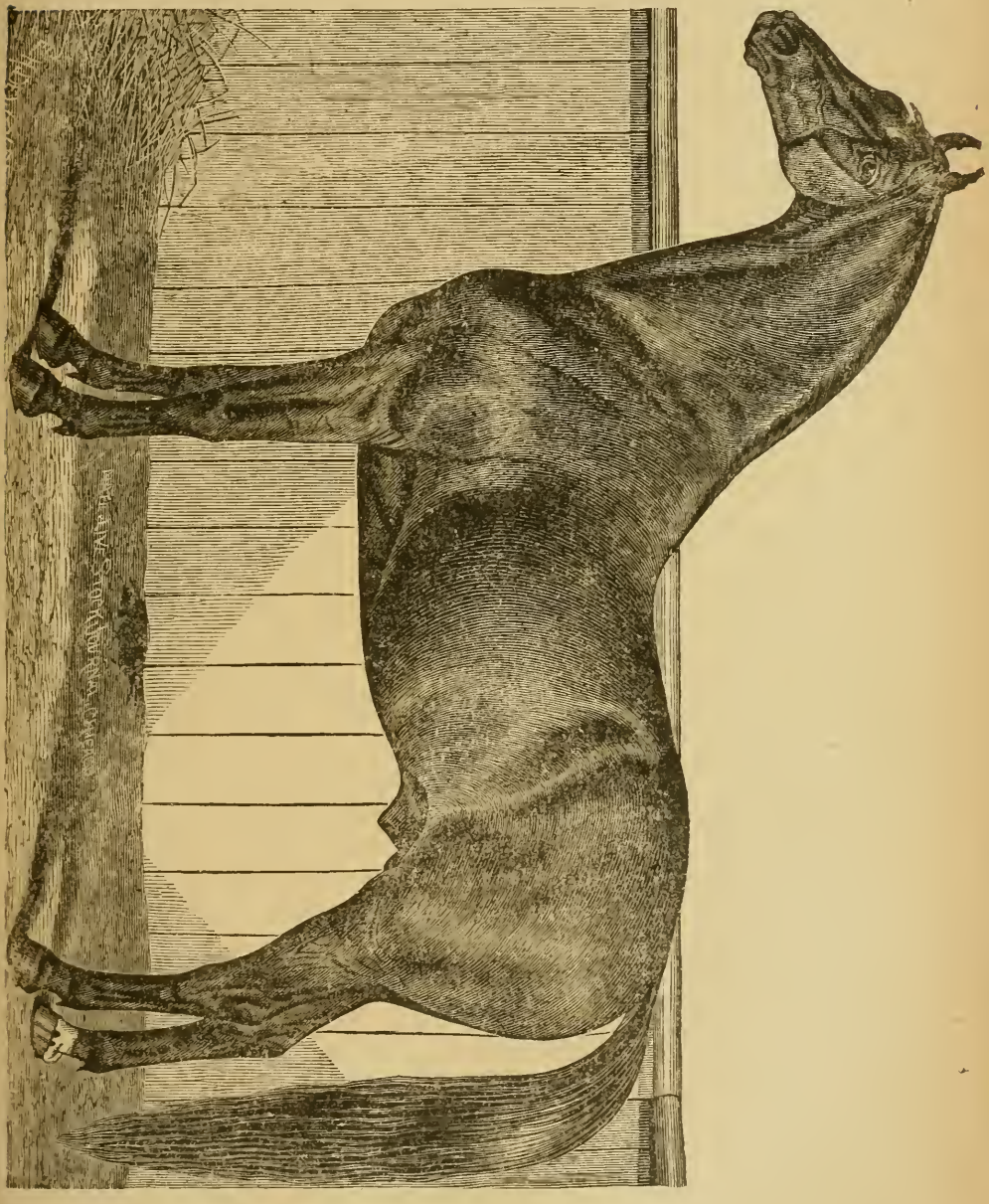
To arrive at a clear understanding of the proportions of the horse, we give an outline that will be a good study, not only for the beginner, but

will be valuable for reference for any horseman, however expert he may be. This illustration combines the average measurements of six horses, accepted for perfect symmetry, and taken, says Mr. J. H. Walsh (Stonehenge)---one of the most graphic and lucid of English writers on the horse—two of them from celebrated stallions, two from thorough-bred hunters, and two from chargers of great value. This, therefore, will not apply to draft horses, but it will be found that the nearer the general utility horse comes to these measurements, the better he will be.

	Inches.
Height	68
Length from shoulder-point to quarter	66
From the lowest part of the chest to the ground	36
From the elbow-point to the ground	39
From the withers to the pole, just behind the ears, *in a straight line*	30
The same measured along the crest	32
Length of head	22
Width across the forehead	9 1-2
From the withers to the hip	22
From the stifle to the point of the hock, in the attitude shown in the plan	29
From the root of the tail to the stifle-joint	26
From the point of the hock to the ground	22 1-2
Length of arm from the elbow to the pisiform bone (the rear bone of those forming the upper articulation of the knee)	19 1-2
From the pisiform bone to the ground	19 1-2
Girth varies from	78 to 79
Circumference of fore-cannon bone (large metacarpel or shank bone, extending from the knee to the fetlock)	7 1-2, 8, 8, 8, 8 1-2 and 9
Circumference of arm just below the elbow	16 1-2 to 18

The foregoing is not to be taken as a fixed rule in comparing ordinary horses, nor even those well-bred. Eclipse, for instance, may be given as a most wonderful horse, differing in many material respects from these measurements. He was three inches taller at the withers, and yet higher in the croup than at the withers. His head was of the same length as the average given, but it is said to have been twelve inches across at the forehead. He was a big horse in every respect; tall, lengthy, capacious in body, higher behind than before, his neck and back long, the loin roached, his limbs would by some be called long, but they were strong with large joints, but fine; his quarters straight, square and extended; thighs long and muscular; shoulders only moderately oblique, and of fair depth; his knees and hocks broad and well formed; head small, and as will be observed from its great breadth of forehead, Arab-like. On the whole it would probably be difficult to improve the proportions of Eclipse, simply as a weight-carrying racer. For the hunting field, the fine saddle horse, or any of the uses to which practical men put their horses, aside from flat racing, select as many of the superior points of

Eclipse as you can find, but leave out the low withers and high croup. The horse that will come to the standard that we have given in the diagram, is as a rule the horse to buy.



A CLEVELAND BAY.

IV. The Cleveland Bay for Profit.

Of late years this admirable and stylish horse as improved from the

old farm horse of fifty years ago, has attracted attention in the United States, and especially in the West, where many fair specimens have been imported. As showing the characteristics when standing extended and at rest, we give a portrait of a pure bay, in color, with a star in the forehead, and one white hind fetlock. These dashes of white not detracting from the style of any horse, and showing breeding. It is a horse showing blood and breeding, with lofty crest, magnificent withers, round barrelled, and clean limbed, a coat like satin, and a head of excellent proportions. Colts from such a horse out of large, roomy mares of good style, will always sell for high prices. When you find such a stallion do not be afraid to buy, he will pay, and his foals will pay for their feed and training.

The old fashioned horse of this race, the Cleveland bay, is extinct and gone. The present form is the result of crosses with staunch thoroughbreds, giving better form throughout, greater speed and eminent style. We consider them as among the very best from which to breed stylish animals from proper mares. Horses that may do the ordinary farm work until six years past, and then be sold at good prices for stylish omnibus, express, light draft, and carriage horses in our cities. Farmers who have large, well built mares, wishing to breed colts that shall have size enough for any farm or road work; that will breed to uniform color, so that they may be easily matched; that will have style—not that of the blood horse, or light driving, or trotting horse—will do well to investigate the characteristics of the Cleveland bays. Canada has acquired a high reputation for stylish, well matched coach horses. It is founded in a great measure upon crosses produced by breeding the modern Cleveland bays upon large, handsome mares of more or less breeding.

Such horses if properly cared for will do eight or nine miles an hour, in harness, and under the saddle may be pushed up to twelve miles an hour; are active in all their gaits, tractable, easily managed, intelligent, fast walkers, always ready for their feed, and as eager at labor, as they are kind and intelligent every where. The late Henry William Herbert, (Frank Forester), a thorough horseman, an accurate judge of horse flesh, and a finished writer, in his voluminous work, "The Horse of America," thus describes the original Cleveland bay, and also the improved horse of his time: "The Cleveland bay, in its natural and unmixed form, is a tall, powerfully built, bony animal, averaging, I should say, fifteen hands three inches in height, rarely falling short of fifteen and a half or exceeding sixteen and a half hands.

The crest and withers are almost invariably good, the head bony, lean, and well set on. Ewe-necks are, probably, rarer in this family than in any other, unless it be the dray-horse, in which it is never seen.

The faults of shape to which the Cleveland Bay is most liable are narrowness of body, and flatness of the cannon and shank bones. Their color is universally bay, rather on the yellow bay than on the blood bay color, with black mane, tail, and legs.

They are sound, hardy, active, powerful horses, with excellent capabilities for draft, and good endurance, so long as they are not pushed beyond their speed, which may be estimated at from six to eight miles an hour, on a trot, or from ten to twelve—the latter quite the maximum—on a gallop, under almost any weight."

The large and more showy of these animals, of the tallest and heaviest type, were the favorite coach horses of their day; the more springy and lightly built, of equal height, were the hunters, in the days when the fox was hunted by his drag, unkennelled, and run half a dozen hours or more, before he was either earthed or worn out and worried to death. Then the shorter, lower, and more closely ribbed up were the road hackneys, a style of horse unhappily now almost extinct, and having unequally substituted in its place a wretched, weedy, half-bred or three-quarters-bred beast, fit neither to go the pace with a weight on its back, nor to last the time.

From these Cleveland Bays, however, though in their pure state nearly extinct, a very superior animal has descended, which, after several steps and gradations, has settled down into a family common throughout all Yorkshire and more or less all the mid-land counties, as the farm horse, and riding or driving horse of the farmers, having about two crosses, more or less, of blood on the original Cleveland stock.

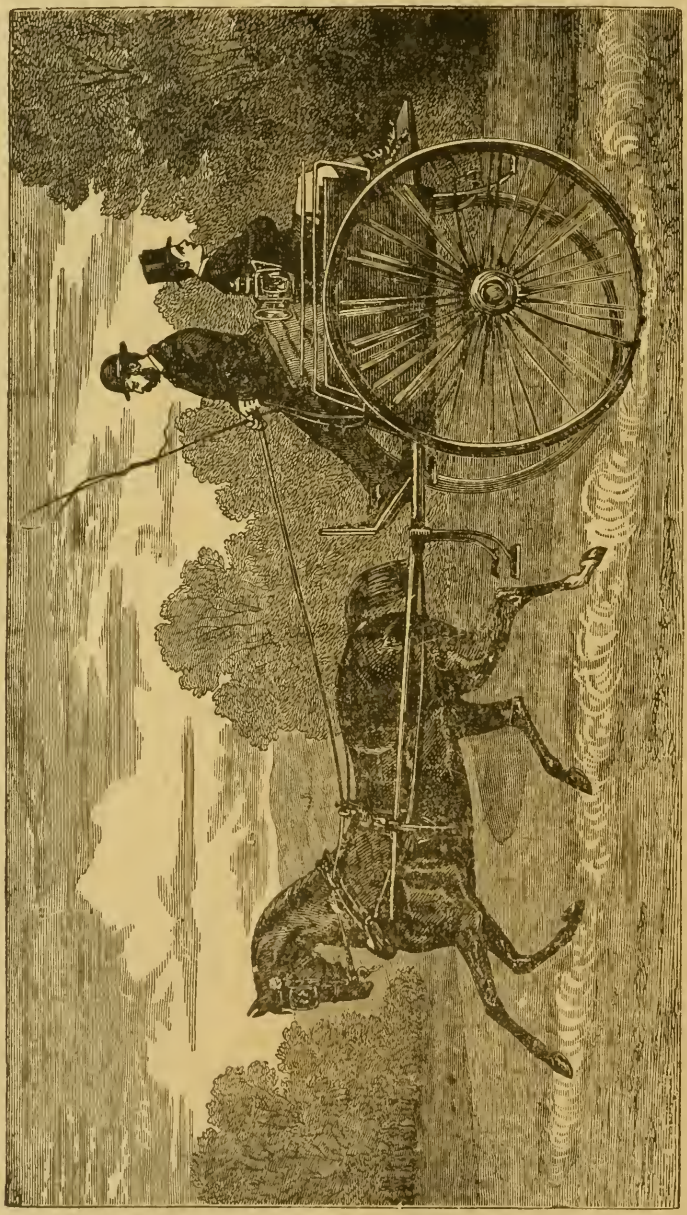
The first gradation, when pace became a desideratum with hounds, was the stinting of the best Cleveland Bay mares to good thorough-bred horses, with a view to the progeny turning out hunters, troop horses, or, in the last resort, stage-coach horses, or, as they were termed, machines. The most promising of these well bred colts were kept as stallions; and mares of the same type, with their dams, stinted to them produced the improved carriage horse of fifty years ago.

The next step was putting the half-bred fillies, by thorough-breds out of Cleveland Bay mares, a second time to thorough-bred stallions; their progeny to become the hunters, while themselves and their brothers were lowered into the carriage horses; and the half-bred stallions which had been the getters of carriage horses were degraded into the sires of the new, improved cart horse.

V. The Light Harness Horse.

In many cases, where the roads are superior, and the animal is used in a vehicle of the lightest construction, to carry only one person, size is

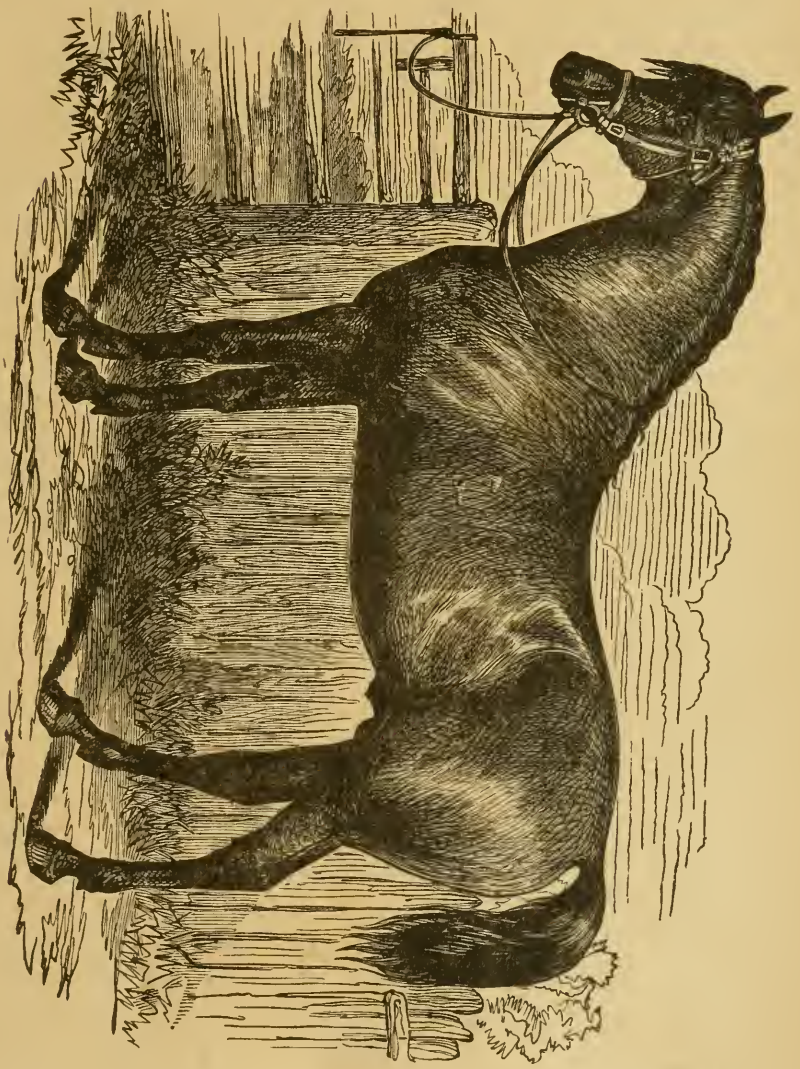
not always necessary. Very many horses of fourteen and a half hands are exquisitely handsome and capable of very fast work. One of the best we ever knew was a St. Lawrence mare fourteen hands high, that



A FINE TROTTER IN LIGHT HARNESS.

very few large horses could get by on a smooth road—the "Baby," as she was called—when driven on a track, always going as a pacer.

The illustration on opposite page is of an English light harness, two-wheeled turn-out, a vehicle now occasionally patronized by fast living young gentlemen. For style of going, the horse is as perfect as he is handsome in his make-up, but not showing the high knee action considered stylish with all two-wheeled turn-outs.

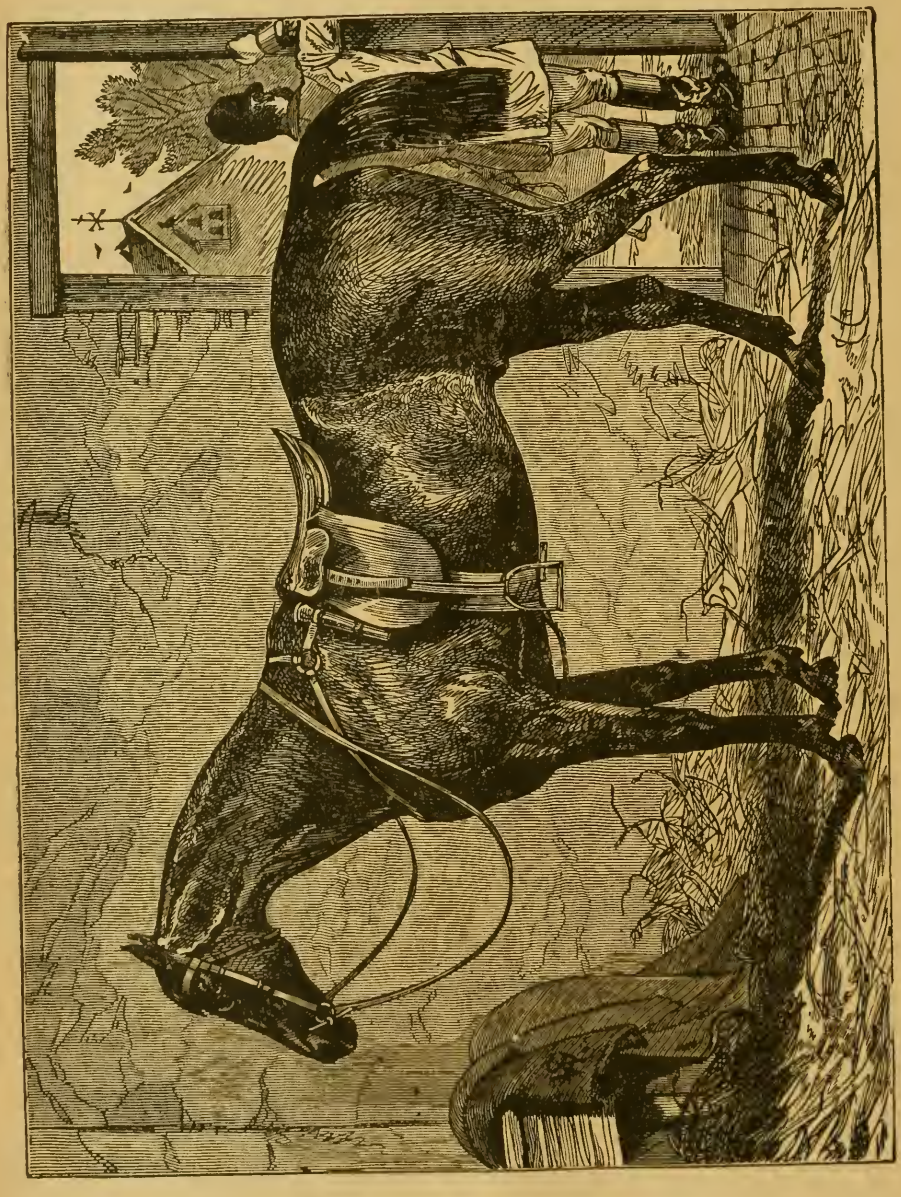


A GOOD FORM FOR SADDLE HORSE.

VI. Saddle Horses of all Gaits.

It has always seemed a pity that farmers sons have not taken more kindly to the saddle than American youths do. It is well enough for

men of mature age to favor the buggy or light wagon, but every young man and woman raised in the country should be taught to sit a horse perfectly, and to manage him at all gaits. In the South this is the case, but



A HORSE OF GOOD ACTION.

in the North the perfect saddle-seated rider is rarely found. Lately, thoroughly trained saddle horses are much sought after in our cities, and certainly there is no place where they may be so perfectly trained as in

the West. Every respectable farmer should have at least one well trained saddle horse to sell when called for. Twelve months training will put them in form. For good wear-and-tear, compact, able as a good leaper, of fine form, and undoubted bottom for any distance, the illustration, page 165, will give an idea of what such a saddle horse should be.

VII. The High-bred Hunting Horse.

When a long stride, great leaping powers, and ability to go long distances at high speed is required, the horse should be not less than one-half to three-quarters bred. A greater proportion even is favored in the South, where the passion for hunting is only second to that in England. The illustration of a horse of extra good action as given on page 166, will be seen to combine size, indicating capacity for carrying great weight; high breeding, as shown in the crest and head; wonderful lungs; great length of hip and limbs, and being near perfection as possible; a high caste horse that will not fail his rider in time of need.

VIII. Racing Horses.

There is one more class of saddle horses worthy of special notice: the thorough-bred racing horse, the foundation upon which has been built all that is valuable in every horse where speed, bottom, elegance, and great bone, sinew and muscle in every respect are required. It is the fact that on the race course there have been schemes and tricks practiced, probably there always will be those scandalous in the extreme, but frowned upon by all breeders of respectability. Among the more respectable associations rules of the most stringent character have been drawn, and fairly lived up to. If dishonest jockeying can be still further eliminated the true animus of the turf may have a bright future before it in still farther improving the breed of staunch thorough-breds, capable of carrying weight, and with bottom to get the rider two, three and four miles at high speed. These are what are really wanted, and not those that at the end of a quarter or a half mile are entirely blown and jaded, or as an Englishman would express it, quite "pumped out."

IX. What the Racer Should Be.

The model racing horse should be from fifteen and a half to sixteen hands high, full and muscular in his build, with clean, sound limbs, short backed, round in the barrel, with long hips, deep and oblique shoulders,

a rangy and not too muscular neck; a head fine, bony and with rather large muzzle and prominent nostrils, broad in the forehead, with a full, bright, but mild eye, denoting a high nervous temperament, uniting

A MODEL FORM FOR SPEED IN RUNNING.

great courage with docility. The accompanying illustration will give a correct idea of a horse of great speed, high courage and lasting powers of endurance.

X. To Avoid Vices and Defects—How to Detect.

They are legion, and he who at present buys any horse, whether for speed or work, must be on his guard against them. Among the principal disabilities to be guarded against are:

1.—Bone spavin, curb, ring-bone and splints.—To detect these look at the horse from before and behind, for spavin and curb at the hocks; for ring-bone, at the fetlocks; and for splints, below the knee. Feel the bones at all these parts for tenderness or enlargement. If they appear, reject the horse instantly. He will be worthless as a sire, or for riding or driving.

2.—Stumbling.—Examine the knees to find if they are scarred, or show the marks of previous injuries, or that have been operated upon for callosities. Then walk him over somewhat rough ground, and at a slow pace, with an entirely loose rein, to see if he trips or goes weaker on one leg than on the other. If he is a stumbler, he is the most dangerous animal a man can own, unless it be a kicker; in fact, more so than the latter, since kicking may be guarded against, when knowing the vice.

3.—Kicking.—If this is suspected, the animal will lay back his ears if approached in an apparently careless manner, though horses do this sometimes from mere playfulness. If they are vicious, they will lay their ears more completely back, and the eyes will also denote their intention. Examine the stall where it is known they have stood for marks of their hoofs, and above all, give the animal a chance to show his propensity when the groom is not near.

4.—Pulling at the halter or bridle when tied.—Tie him up in a close yard, with a halter he can easily break, leaving him quite alone for about half an hour, to exhibit his propensity if he will.

5.—Crib-biting.—If the horse is a confirmed crib-biter, his teeth—the central incisors—will show wear where he has grasped objects to enable him to get leverage to perform the operation. Tie him out to a stump, or at a post about three feet high, and watch him, no person being in his sight.

6.—Balking and backing.—Horses seldom balk under the saddle; when they do, they are dangerous in the extreme, often stopping suddenly when under motion, or backing into dangerous places. It is difficult to detect, for they will sometimes go days, weeks and even months all right, and then suddenly show the vice. As a rule, it is exhibited by bad tempered, badly trained horses. A warrant from a respectable owner is the best guarantee. It may sometimes be detected, if a person strange to the horse mounts and attempts to start him sud-

denly. In harness it may often be detected by the manner in which the animal starts and travels.

7.—The Rogue.—The rogue is the horse of vices; he may take the bit in his mouth and run away, he will rear, back, kick, strike, bite, and do twenty other unpleasant tricks, not always from pure vice, but often from exhuberance of spirits, or from being crossed in some way. They generally perform well enough after they have found out that their rider is their master. They are difficult to detect in their vices, except by the thorough horseman, who is well versed in every expression and act of the horse.

8.—Bishoped Teeth.—So named from the scoundrel who invented filing an old horse's teeth to make him look young, even to burning and blackening the cups formed. A careful study of the chart of the horse's teeth, given in this book, will enable any person to detect this, since it is impossible to cover the shrinking of the gums, by which the teeth show narrow, and are peculiar in shape.

9.—Weak Eyes.—Whatever the occasion, have nothing to do with a horse with bad eyes. Bring the animal from a rather dark stable just inside the door where the full light may strike the eyes. Examine the lids and pupils carefully, to see if there is any considerable shrinking; the eye should be able to bear the full light. Horses are sometimes near-sighted, and also far sighted. *Nearly all shying horses become so either from defect in vision* or from cowardice.

10.—Moon Eyes.—This is a specific ophthalmy, from which one or both eyes periodically change color, and during the paroxysm it may become entirely blind. During the interval the eyes look natural. It is better, if the buyer suspects this, to take a warranty against it.

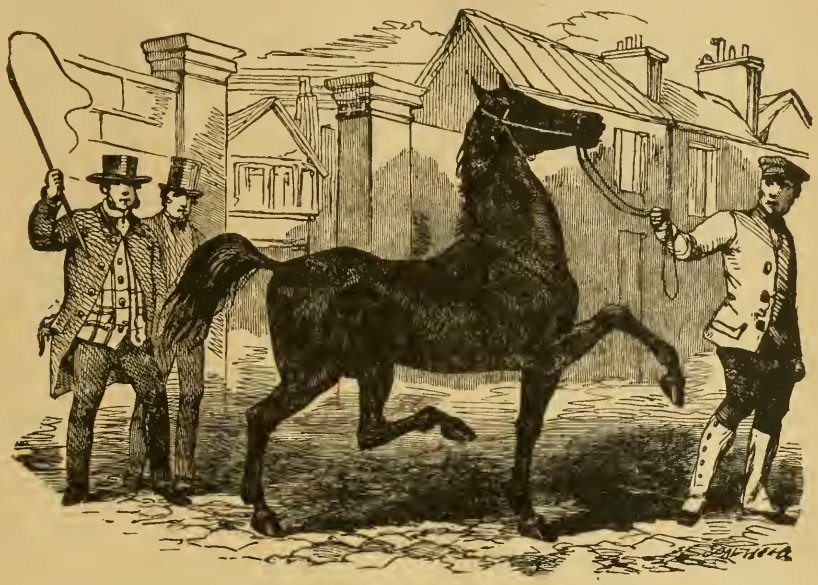
11.—Blindness.—This is sometimes difficult to detect by the ordinary observer by looking at the eyes. In rare cases the eyes may seem natural. A blind horse, however, may be detected by his mode of progression. As an example we give an illustration showing the mode of progression of a totally blind horse.

XI. Other Faults and Imperfections.

The disabilities noticed in the previous sections are those of positive unsoundness, or else of determined vice. Some others that should not be overlooked, are easily discovered by careful examination and test. These are:

1. Glass Eye.—This, if not complicated with specific disease, does not interfere with sight in any respect. It is a serious defect, simply so far as looks are concerned. Usually only one eye has this peculiar white

glassy appearance, the pupil perfect, and the iris quite natural. It should affect the price of the animal, only as detracting from elegance.



THE MODE IN WHICH A HORSE PROGRESSES WHEN BLIND.

2. White Spot.—Sometimes a small white spot will appear on the eye of a young horse, generally after three years of age, and usually near the outer corner. It has a peculiar cloudy appearance, sometimes increasing to the size of a hemp seed, and occasionally larger. The duration is variable, sometimes lasting for years, and again disappearing in a short time. It really impairs the vision but little, if any. Unless its history is known a veterinary surgeon should decide whether it is incipient cataract or not. Some veterinarians have termed it spurious cataract, but this is entirely a misnomer. The name white spot describes it perfectly.

3. Roaring.—This is the result of obstruction in some part of the larynx or trachea, impeding the breath, and causing a peculiar roaring sound when the animal is in motion. It is rarely found in the United States, being chiefly confined to draft horses. It is often the result of chronic cough. In England it is quite common, and when present in a horse of fast work, will render him worthless for the road. It may be discovered by urging the horse to a fast gait.

4. Oblique Tail, or Wry Tail.—This is caused by contraction of the muscles of the tail on one side. It may sometimes be improved by a surgical operation, and should be considered a serious defect in any horse, and especially so in a driving horse.

5. Turning the Toe of the Hoof out or in Unduly, Sand Cracks, Quarter Cracks, Dish Hoofs, Over-reaching, Interfering, etc., are all to be looked for before finally buying a horse. They are all disabilities that should not be present where the purchaser pays full price for the animal. They are, however, all so apparent that the purchaser is to blame if he fails to see them.

6. Wolf Teeth.—These rudimentary teeth, which are found in some horses but not in mares, and which have been supposed by ignorant persons to produce blindness, and other diseases, are entirely harmless, except for the abrasion they sometimes occasion to the tongue and cheeks. If they do so they are easily taken out by any sensible blacksmith. In fact it is quite well to extract them, not that they will produce serious disease, but simply because they are not of any value, are useless to the animal, and may occasion slight inconvenience.

7. Shying.—This is one of the most dangerous habits a horse can have, whether it be occasioned by cowardice—seldom the case; injudicious punishment—more common; or from defective eyesight, or from all these combined. If you are so unfortunate as to have a shying horse endeavor to break him of the vice by allowing him to examine objects of which he is afraid, by speaking soothingly to him, but never by whipping or spurring him. When he shows a disposition to shy turn his head to rather than from the object. Stop him; let him approach the object and touch it with his nose, for soon he will approach it himself. If simply caused by nervousness, he may thus be cured. If caused by being short sighted there is no means of relief. Before you buy a horse be certain that he has not this infirmity, as dangerous a one as it is disagreeable. Such an animal is only fit to be driven by the side of another horse who will keep him to his work, and upon which he at length will come to depend, or of being driven as a wheeler in a team of four horses.

CHAPTER XI.

HOW TO BUY, CONTINUED.

I. BUYING CHEAP HORSES.——II. COLOR, IN RELATION TO VALUE. —— III. ACTION. —— IV. FAST-WALKING HORSES. —— V. WHAT A HORSE SHOULD BE. —— VI. WHAT CONSTITUTES UNSOUNDNESS.——VII. ILLUSTRATION OF FORM AND SYMMETRY.——VIII. THE BODY AND LIMBS.——IX. THE BODY AS STANDING FACING YOU.——X. FRONT VIEW OF FORE-QUARTERS, SHOWING DIFFERENT BAD CONFORMATIONS. —— XI. THE HIND-QUARTERS.——XII. THE VIEW FROM BEHIND.——XIII. WHAT NOT TO BUY.——XIV. BUYING FOR BLOOD.

I. Buying Cheap Horses.

In the preceding chapter on this important subject we have endeavored to show some of the principal points to be considered in buying a horse, especially those relating to the use for which they are intended. There is one rule that will always apply in buying any horse. Never buy him because he is offered at a price evidently far below his worth, that is, except it be from a friend that you can trust, who does not want the horse himself, and wishes to do you a favor. These cases will be found very rare. In every other case rest assured the horse has some dangerous vice, or is permanently unsound. In this country never buy a horse at any price which has any appearance of broken knees by falling. Hunting horses are too rare here for one to have gotten the hurt in the field, and, accidentally, by being put at a barrier beyond his power.

Reject a horse with any weakness in his eyesight, unless you have use for a blind horse, then buy him at a blind horse's price. A one-eyed horse may do useful, but not elegant work. Never buy a lame horse at any price, until you are assured that the disability is not permanent.

Foot lameness, except it may be from a slight corn, and consequently

curable, should be an insuperable bar to purchase. You can never paten up a bad foot. Therefore be sure you always try the intended purchase on a hard road. Many game horses, dead lame on hard roads, will get along without much flinching on soft roads, or the turf. If you are certain as to the cause of the lameness and know you can cure it, the purchase, as a speculation, may do; but never rely on the assurance of the horse dealer. It is his business to sell.

Never buy a narrow chested horse for hard service. It shows weak lungs and those liable to inflammation. If for saddle, avoid a very broad chested horse, though as trotters they are sometimes fast. The best and most perfect chest is a medium between the narrow and broad chest.

A tucked up washy looking horse should be avoided. They may indeed do for light work or short drives, but are totally unfit for real work.

In buying avoid all defects in the wind; be sure the disability has not been temporarily covered up, by special means known to horse dealers. A whistler or roarer may show no indication of his infirmity at a slow pace, or up to a certain speed. Beyond that it is apparent. Broken wind is an incurable infirmity and probably as distressing to the horse as the asthma is to man. A horse may make more or less noise and yet not have broken wind. Any indication of this, however, is to be looked on with suspicion.

In buying a horse his points of excellence and infirmity are better shown if only in fair working condition than when very fat. A horse very fat is pretty nearly a useless creature until his condition has been brought down to that of bone, sinew and muscle, with just sufficient fat to lubricate, so to speak, the working parts. Yet a horse for slow draft may be serviceable and carry far more flesh and fat than one used for fast work. Many superior horses have been ruined by hard driving when fat, or soft.

II. Color in Relation to Value.

It is a saying as trite as it is old that any color is good in a good horse. Yet a horse, however good otherwise, should be invariably rejected if his color is bad. For instance, it would essentially mark both an ignorant and vulgar person who would select a piebald, spotted, or otherwise extraordinary color for a carriage horse. It would savor of the circus or show ring.

As saddle horses for gentlemen, self-colors are the best, and those distinct. A star in the forehead and two white feet behind give character. A snip in the face, if large, is objectionable. Four white stockings more so. Bay, brown and dark chestnut are the preferable colors. If the

horse is exceptionably stylish, black and dapple gray are good colors. Gray horses are often bad tempered, and black horses are not as a rule, docile. For ladies' use a dark cream color with white mane and tail, or that rare combination, a dark chestnut with darker tail and mane are elegant if of good form. So a strawberry roan, if unexceptionable in style and form, is elegant.

For single or double light driving, all distinct colors are good. Uneven or curiously marked horses are allowable in a fancy team—as a mismatch in distinct colors—as it is called. The colors should be distinct and in strong contrast, or else harmonious. A chestnut and a dark bay would be harmonious, and yet distinct colors. So would be a chestnut and a brown; a cream with white mane and tail, and a chestnut with dark mane and tail would show a marked contrast, and yet be elegant; so would be cream-colored horses so marked. A pure white and a jet black would be the most marked contrast possible, and not for a moment admissible, except both were faultless in form and style of going. Here in fact is where the fine art lies in teams of two distinct colors: *Whatever the mismatch in color, the team should be as near alike in form and carriage as possible.*

III. Action.

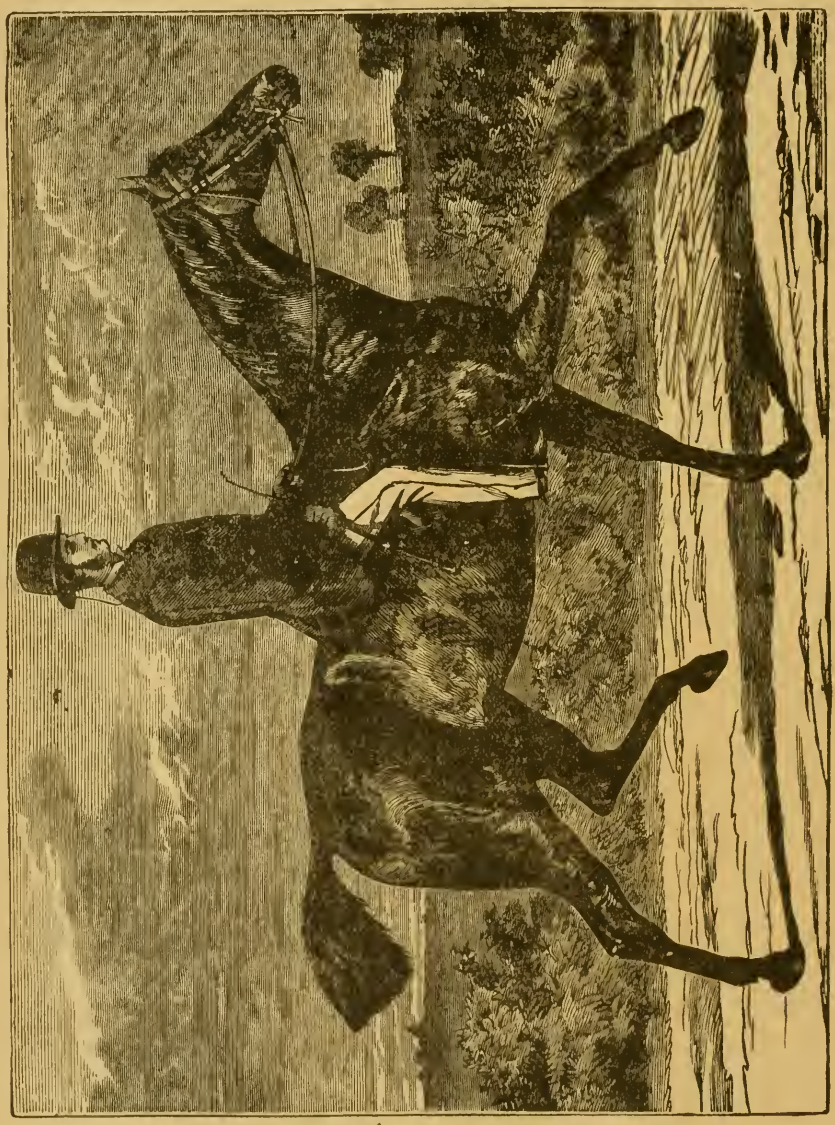
There are really but two styles of action: low, smooth, safe action, and high-stepping, showy action. The latter of little account except for parade and showing off on the road in connection with fine style. A high-stepping dolt is as unsafe as he is ungainly. The action that is slow and safe, and fast and safe, if combined in an animal is invaluable.

A horse with really good action moves all his limbs evenly, and brings his hind legs well under him at every movement. Some horses with round action in front—paddlers they are called—are often staunch and sure-footed, but this is in spite of this action, not in consequence of it. Horses that straddle behind are often exceedingly fast trotters. Yet neither of these movements are what would be sought, either in a fine saddle horse or in a good harness horse.

IV. Fast-walking Horses.

We have before stated that a perfect and fast walking gait was not only indispensable to every horse, but the most valuable gait a horse could have for every day use. Yet we seldom see a horse that will walk four and a half or five miles an hour, even when urged and in regular 1–2–3–4 time, nodding his head harmoniously in cadence. If a purchaser gets such a horse, or one that will do four miles under the saddle with-

out stumbling, shuffling, dropping the step or breaking, be sure you have a good one at speed, if he has speed, for many great walkers are so broad chested that they cannot trot fast, and in galloping they will roll.



MOVEMENT IN WALKING.

Yet occasionally a horse will be found good at all gaits. When so, it is the result of exceptionably good form and careful training. He who can so train a horse, may get a long price for his trouble and skill.

V. What a Horse Should Be.

We have been very minute in stating the points of perfection in a horse, and have been particular in urging that the lungs, limbs and feet should be super-excellent. In addition, and as from one of the best authorities, we quote from the late H. W. Herbert, upon the physical structure of the horse, before illustrating physical perfection and perfect conformation. Mr. Herbert says:

"The points of the physical structure of a horse on which the most, indeed the whole of his utility depends, are his legs. Without his locomotors all the rest, however beautiful it may be, is nothing worth. Therefore, to these we look first. The fore-shoulder should be long, obliquely set, with a considerable slope, high in the withers and thin above. The upper arm should be very long and muscular, the knee broad, flat and bony, the shank, or cannon bone, as short as may be, flat, not round, with clean, firm sinews; the pastern joints moderately long and oblique, but not too much so, as the excess produces springiness and weakness; the hoofs firm, erect or deep, as opposed to flat, and the feet generally large and round. In the hind-legs the quarters should be large, powerful, broad when looked at in profile, and square and solid from behind. The hams should be sickle-shaped, not straight, and well let down, so as to bring the hocks well toward the ground. The hocks should be large and bony, straight, not angular and convexly curved in their posterior outlines; the shanks, corresponding to the cannon bones, short and flat, and the hind feet similar in form to the front. The back should be short above, from the point of the withers and shoulder-blade, which ought to run well back to the croup. The barrel should be round, and for a horse in which strength and quickness are looked to more than great speed and stride, closely ribbed up. A horse can scarcely be too deep from the tip of his shoulder to the intersection of his fore-leg—which is called the heart-place—or too wide in the chest, as room in these parts gives free play to the most important vitals. The form of the neck and setting on of the head are essential not only to the beauty of the animal, but to the facility and pleasure of riding or driving him; hence, with an ill-shaped, short, stubborn neck, or ill set on head, the animal cannot by any possibility be a pleasant-mouthed horse, or an easy one to manage. The neck should be moderately long, convexly arched above from the shoulders to the crest, thin where it joins the head, and so set on that when yielding to the bit it forms a semi-circle, like a bended bow, and brings the chin downward and inward until it nearly touches the chest. Horses so made are always manageable to the hand. The converse of this neck, which is concave above and stuck out at the

windpipe like a cock's wattle, is the worst possible form; and horses so made almost invariably throw up their heads at a pull, and the most exceptionable of brutes, *regular star-gazers*. The head should be rather small, bony, not beefy, in the jowl; broad between the eyes, and rather concave, or what is called basin-faced, than Roman-nosed, between the eyes and nostrils. The ears should be fine, small and pointed; the eyes large, clear and prominent, and the nostrils wide and well opened. A horse so framed cannot fail, if free from physical defects, constitutional disease and vice, to be a good one for any purpose—degree of strength, lightness and speed being weighed in accordance with the purpose for which he is desired."

VI. What Constitutes Unsoundness.

1.—*Spavin*, whether it be *bog spavin*, *blood spavin* or *bone spavin*, when sufficiently developed to be known.

2.—*Ossification* of any of the structures adjacent to any of the joints and also without doubt ossification of the lateral cartilages.

3.—*Corns* are considered as constituting unsoundness, but they must be discovered within a short time, say a few days of the purchase.

4.—*Curbs* constitute unsoundness, but they must be shown to exist at the time of the sale.

5.—*Founder* or *Laminitis*, is unsoundness whether it produces lameness or not, for if it has existed the laminæ will have been injured and the horse will be lame when worked.

6.—*Pumiced Foot* is unsoundness as evidence of laminitis.

7.—*Quittor* may render the horse permanently unsound.

8.—*Ring-bones* and side-bones constitute unsoundness.

9.—*A Nerved Horse* is unsound as showing the existence of disease for which the operation was performed, and also from the division of the nerves.

10.—*String-Halt* is unsoundness.

11.—*Thrush* is so when severe.

12.—*Breaking* down, even though the horse has recovered so as not to go lame.

13.—*Thickening of the Back Sinews*, or suspensory ligament, if known to exist, is unsoundness.

14.—*Broken Wind*, *Thick Wind*, *Whistling* and *Roaring* are all considered as constituting unsoundness, as forming impediments in breathing, injuring the animal for drawing or other active service.

15.—*Farcy and Glanders.*

16.—*Grease and Mange.*

17.—*Cough*, if it lasts. A horse with a chronic cough is clearly unsound.

18.—*Megriems*, if it can be shown that the horse has had an attack before the sale.

19.—*Ophthalmia*, if it occurs soon after the purchase. The evidence of a veterinary surgeon may be necessary to show the previous presence of the disease.

20.—*Cataract*, however slight, constitutes a horse unsound.

21.—*Broken knees*, when the joint is injured.

There are also vices for which a horse may be returned. These are:

1.—*Biting*, when clearly vicious.

2.—*Bolting*, or running away.

3.—*Crib-biting*.

4.—*Kicking*, when shown to be vicious.

5.—*Balking*.

6.—*Rearing*.

7.—*Shying*, when habitual.

8.—*Weaving in the stable;* that is, the horse throwing his head and body from side to side with a peculiar motion.

VII. Definition of Unsoundness and Vice.

Unsoundness may be considered to be the existence of disease or alteration of structure sufficient to impair the natural usefulness of the horse. *Vice* may be defined as the prevalence of a habit which interferes with the natural usefulness of the horse. In unsoundness or vice, however, either must be marked, as for instance the following diseases or accidents would not constitute unsoundness:

1—Slight bog spavin; 2—broken knee, when the joint is not injured; *3—capped hocks*, or elbows; *4—contractions of the foot*, unless the result of disease, laming the horse; *5—curby hocks; 6—splints; 7—thorough pin*, and *8—thrush*, are not unsoundness in their incipient stage, or in a mild way. But the buyer should refuse all such except, perhaps, in the case of thrush. *9—Cutting* is not unsoundness, except the horse be lame at the time of sale, neither *10—soreness* of the joints from labor, or *11, windgalls*.

They are found often upon colts, but if the animal be lame reject him. When a horse is bought on warrantee, it must be written and concisely so. Do not allow verbiage to cause litigation. The following form will cover the whole ground:

Received.....(insert place and date) *of Mr*.....(insert name).....Dollars,.....

for.....describe horse or mare, and pedigree of same, if any.....warranted.....years old.....(state age).....sound, free from vice, and quiet to ride or drive.

When filled out this might read as follows:

Received, St. Louis, Mo., March 1st, 1880, of Mr. John Doe, five hundred dollars for a bay mare by Lancer, dam Lady, warranted five years old and under six years, sound, free from vice, and quiet to ride or drive. RICHARD ROE.

This, with such careful examination as we have advised, ought to insure any buyer against danger in case the seller is solvent.

VIII. Illustrations of Form and Symmetry.

The head of the horse is the seat of intelligence, and to the conformation of the head we must look not only for intelligence but docility and courage, or the opposite character, as we must look to the teeth for indications of his age, to the nostrils as indicating his capacity for breathing, to the muzzle and jaw for indications of capacity and feeding, and to the eye and ear as showing fire, courage, and good temper. No man's head and face are more expressive than are these elements of a horse.

Speed and bottom, which means the bone and muscle of good breeding whatever the family of the horse may be, is the *sine qua non* desired in a horse. His mission is labor, work of some kind, whether it be carrying a man on his back, or trotting to a wagon, or hauling a load through the mud. The head of the horse is, therefore, one of the first things to be looked at. The extract we have given a few pages back, from one of the most eminent writers of this country on the horse, will convey an idea of what a riding or driving horse should be. The nearer the horse, for general utility, comes to the illustrations we have given, the better he will be.

The horse for heavy draft, while coarser, more stocky and heavier in his frame, should conform to the general characteristics except that he should be more upright as to his shoulders, and not so flexible as to his limbs: then the better will he be. In fact one of the best draft horses we ever owned was a three parts bred Monmouth Eclipse, seventeen hands high, weighing 1250 lbs., pretty well up on legs, and those of exceeding flexibility. But when he got down to work he appeared to go close to the ground. This getting down to work—this getting close to the ground with the body, so every bone and sinew may exert the greatest possible leverage, is one of the fine arts of training. It really brings the oblique shoulder of the blood horse straight in the collar a possibility few horses have the knack of attaining naturally.

Explanation.— The illustrations we give on page 182 show a side and front view of heads of blooded horses, that may be taken as a type of what should constitute as near perfection as may be. Those on page 183, side and front views of heads are bad. By comparing them with the text the reader may form a good idea of characteristics. Observe in the side view, page 182, a fine head, tapering to muzzle, the chin, the prominent and yet bright, clear and soft eye, with a rather prominent brow; the shape and setting on of the ears; the strength of jaw, and at the same time its fineness; how the head is set on to the neck, and the fine, clean, muscular neck as well. In the front view observe especially the width between the eyes, the eyes being in fact apparently at the side of the head, and yet looking straight forward. Observe the cheek bones, widening and strengthening the lower part of the head; the temporal bones at the side of the eye; and the occipital bone at the top of the head between the ears. Especially observe the nostrils and lips as to flexibility and size. Turn back the folds at the end of the nostril, and it will be found you can look clear into the passage, showing a moist and healthy surface, or the reverse.

Let us now examine the side and front views of head on page 183. The side view at the top shows a head somewhat heavy in character, the nose and lower jaw thick to excess. Observe the peculiar formation of the nose. It is not the dish face of the first illustration, giving temper, accompanied with intelligent obedience. The eyebrows are prominent, the head broad, but the expression indicates not only fire but malice. The muzzle is that of a cruel horse, the intelligence that of self-will. The ears, although of good shape and breeding, are thrown back, and the head is set on at too great an angle with the neck.

The figure to the left shows the front view of a badly formed head. It will be noticed that it is of nearly the same width throughout. The eyes are placed very different from those of the front view of good head on page 182; too close together, and too much in front. The expression of the eye shows a stubborn disposition; the ears are good enough, but not held in that position of intelligent action as shown in the lower figure on page 182. They are pointed too close together.

The figure of the front part of a head to the right, on page 183, shows a head not badly formed, but the general expression of the face shows doltishness, and the drooping ears, and the expression of the eyes show not only a cruel but a stupid disposition.

The lower side view of head and neck on same page shows a head indicating a horse that will not only be wild sometimes, but sulky; a self willed, obstinate brute, deficient in intelligence. The profile is curved, giving a Roman nose; the eyebrows are raised, giving the eye a wild

SIDE AND FRONT VIEW OF HEADS—GOOD. (*See Explanation.*

SIDE AND FRONT VIEW OF HEADS—BAD. (*See Explanation*).

expression, and with the firm jaw, a stubborn character. Following the subject still farther, we may find all the gradations of character, including the exhibition of nervous timidity, fear, idiocy, and even insanity; for that there are horses subject to aberration, from mere hallucination to actual insanity, there is no doubt. The latter the most dangerous trait in a horse, since neither caresses nor punishment can cure.

SIDE VIEW OF FORE-QUARTERS, SHOWING A GOOD SHOULDER. (*See Explanation.*)

IX. The Body and Limbs.

Explanation.—Following up the subject on pages 184, 186, and 187, we present side views, showing good and bad fore-quarters. The

first illustration shows as near perfection as may be in the shoulder for staunch qualities, good action and a fast walk. The neck muscular, but without superfluous flesh, but with plenty of substance where it joins the shoulder; the shoulder oblique and deep; the shoulder-blade high, helping to give stability to the withers; the breast prominent, but tapering down to where the legs come out of the body; the arm long, muscular, and yet tapering; the joints large, but yet firm and compact; the fetlocks of fair length and yet flexible; and the hoofs of good size, round, of good depth, tough and sound. An animal possessing the conformation as shown, will indicate a horse good for any purpose where speed and long continued powers of endurance are required. While the illustrations we give are perfect of their kind, and more valuable than any written description alone can be, yet the living animal must be studied, not only at rest, but in motion. The harness horse, however, need not have so oblique a shoulder as we have shown. In fact, few horses, even of the best class, do.

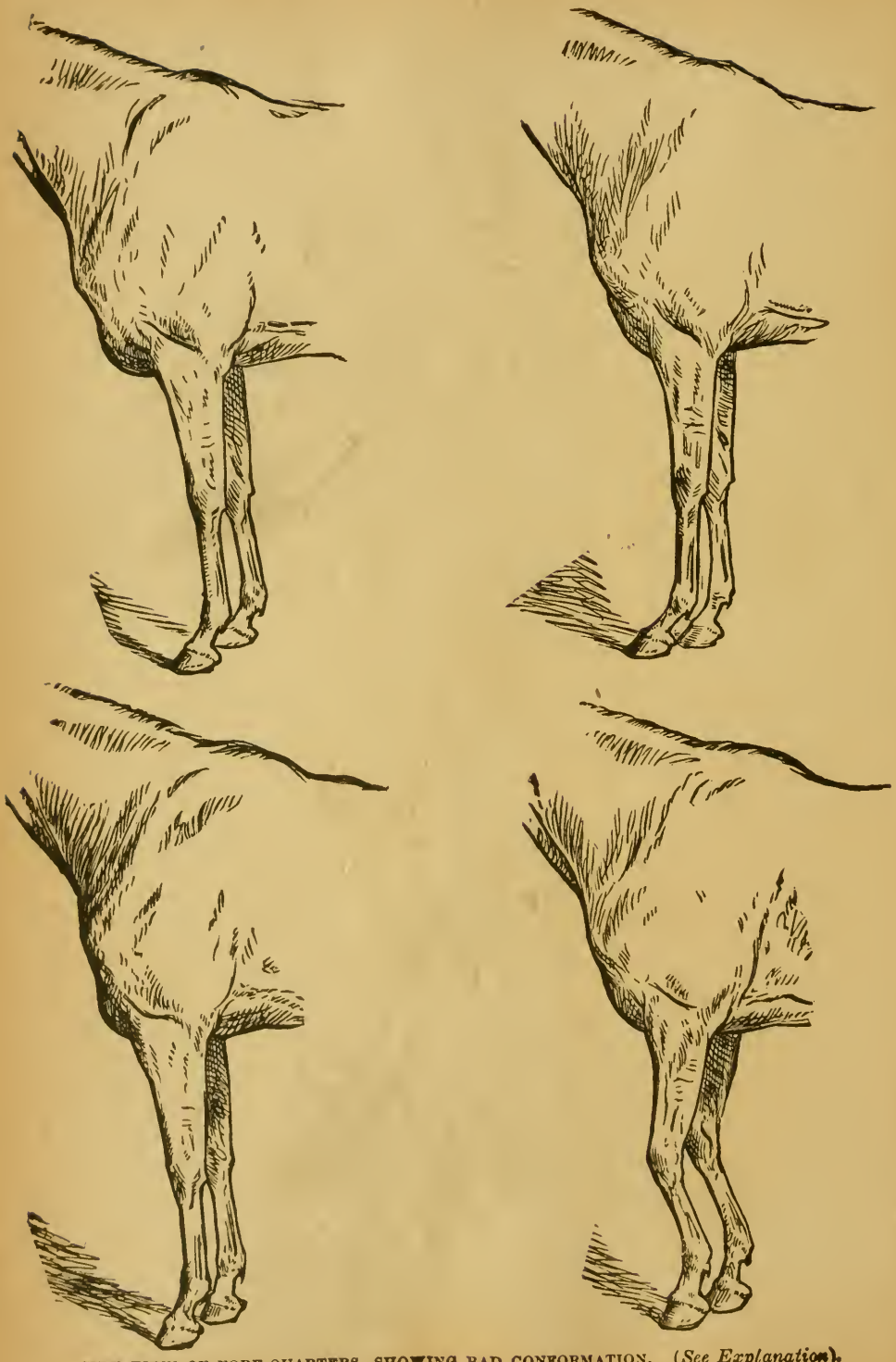
So the trotting gait, combining speed with high action and grand style might be considered vile in a saddle horse. In fact, the saddle horse should have a springy yet smooth motion, and except for show on the road, this will be found to be best for fast and easy work in harness. In practice much of this is often sacrificed, in pleasure horses, for the sake of mere style. The breeding of such horses is a fine art, often a costly one; yet those which fail in the style and action necessary to command the highest price as road and saddle horses, will be found to amply repay the breeding for the general purposes of the farm and for the road.

Explanation.—On page 186 are illustrations showing, the upper one, to the left, a straight shoulder, a heavy chest, and legs placed too far under. The arm seems longer than it is because it lacks muscularity; the shanks, while not positively weak, do not show due strength near the knee and pasterns, and are not as strong as they should be.

The upper figure, to the right, shows a shoulder as bad as the preceding one, and also weak legs and pasterns, the length from hoof to joint above being too great.

The left hand figure at bottom of same page, shows a shoulder fairly well placed, but with the legs set too much under, and the pasterns too straight. Such a conformation will give the horse the appearance of standing on the toes.

The lower figure to the right, shows what old age, hard work, abuse, or all combined, may bring any animal to, that originally may have been not only well bred, but of fair quality throughout. Watch for such limbs in buying, and avoid them.



SIDE VIEW OF FORE-QUARTERS, SHOWING BAD CONFORMATION. (*See Explanation*).

FRONT VIEW, SHOWING BREAST AND LIMBS—GOOD. (*See Explanation*).

X. The Body as Standing Facing You.

The body of the horse viewed in front should present an oval shape, squared off from the arm or elbow joint in front to the point of the shoulder as on page 187. The perfect contour of breast, and especially the magnificent muscularity of the arm is near perfection. The neck rising grandly from the chest shows the perfect proportion of the parts each to the other; the knee and fetlock joints are strong and compact, gradually rounded to meet the shank or leg and bones of the pastern joint. The hoofs are staunch, tough, strong, with nothing about them to denote a flat foot, yet rather open behind, showing a perfect hoof.

Let us now examine the blood horse of the present day as quoted from Herbert, and also that of the ancient Greeks as written upon by Xenophon. It will show that in those days the breeding of horses was a fine art, as was also equestrianism as exhibited in the exquisite sculptures that have come down to us. Yet the quotation we make will show that the horse of the Greeks, useful and admirable as he was, was what the English would call a cab or Galloway, with a dash of thorough blood, and what we would call pony built with a dash of thorough blood—something in fact like a chunky Morgan horse. The quotation nevertheless will make a good study for the young horseman, and is as follows:

"We will write how one may be the least deceived in the purchase of horses. It is evident then that of the unbroken colt one must judge by the construction, since, if he have never been backed he will afford no very clear evidences of his spirit. Of his body then, we say it is necessary first to examine the feet, for as in a house it matters not how fine may be the superstructure if there be not sufficient foundations, so in a war horse there is no utility, no, not if he have all other points perfect but be badly footed. But in examining the feet, it is befitting first to look to the horny portion of the hoofs, for those horses which have the horn thick are far superior in their feet to those which have it thin. Nor will it be well if one fail next to observe whether the hoofs be upright, both before and behind, or low and flat to the ground; for high hoofs keep the frog at a distance from the earth, while the flat tread with equal pressure on the soft and hard parts of the foot, as is the case with bandy-legged men. And Simon justly observes that well footed horses can be known by their tramp, for the hollow hoof rings like a cymbal when it strikes the solid earth. But having begun from below, let us ascend to the other parts of the body. It is needful, then, that the parts above the hoofs and below the fetlocks (pasterns) be not too erect, like those of the goat; for legs of this kind being stiff and inflexible, are apt to jar the rider, and are more liable to inflammation. The bones must not,

however, be too low and springy, for in that case the fetlocks are liable to be abraded and wounded if the horse be galloped over clods or stones. The bones of the shank (cannon bones) should be thick, for these are the columns which support the body; but they should not have the veins and flesh thick likewise. For if they have when the horse shall be galloped over difficult ground they will necessarily be filled with blood, and will become varicose, so that the shanks will be thickened, and the skin be distended and relaxed from the bone; and, when this is the case it often follows that the back sinew gives way and renders the horse lame. But if the horse when in action bends his knees flexibly at a walk you may judge that he will have his legs flexible when in full career; for all horses as they increase in years increase in the flexibility of the knee. And flexible goers are esteemed highly, and with justice, for such horses are much less liable to blunder or stumble than those which have rigid, unbending joints. But if the arms, below the shoulder-blades, be thick and muscular they appear stronger and handsomer, as is the case also with a man. The breast also should be broad, as well for beauty as strength, and because it causes a handsomer action of the fore-legs, which do not then interfere but are carried well apart.

"Again, the neck ought not to be set on like that of a boar, horizontally from the chest; but, like that of a game cock, should be upright toward the chest, and slack toward the flexure; and the head being long should have a small and narrow jaw bone, so that the neck shall be in front of the rider, and that the eye shall look down at what is before the feet. A horse thus made will be the least likely to run violently away, even if he be very high spirited, for horses do not attempt to run away by bringing in but by throwing out their heads and necks. It is also very necessary to observe whether the mouth be fine and hard on both sides, or on one or the other. For horses which have not both jaws equally sensitive, are likely to be too hard mouthed on one side or the other. And it is better that a horse should have prominent than hollow eyes, for such an one will see to a greater distance. And widely opened nostrils are far better for respiration than narrow, and they give the horse a fiercer aspect; for when one stallion is enraged against another, or if he become angry while being ridden, he expands his nostrils to their full width. And the loftier the crest, and the smaller the ears the more horse-like and handsome is the head rendered; while lofty withers give the rider a surer seat, and produce a firmer adhesion between the body and shoulders.

'A double loin is also softer to sit upon and pleasanter to look upon than if it be single; and a deep side, rounded toward the belly, renders the horse easier to sit, and stronger and more easy to keep in condition; and the shorter and broader the loin, the more easily will the horse raise

his fore-quarters and collect his hind-quarters under him in going. These points, moreover, cause the belly to appear the smaller; which if it be large at once injures the appearance of the animal and renders him weaker and less manageable. The quarters should be broad and fleshy in order to correspond with the sides and chest, and, should they be entirely firm and solid they would be the lighter in the gallop, and the horse would be the speedier. But if he should have his buttocks separated under the tail by a broad line, with a wider space between them, and so doing he will have a prouder and stronger gait and action, and will in all respects be the better on them. A proof of which is to be had in men, who, when they desire to raise any thing from the ground attempt it by straddling their legs not by bringing them close together."

XI. Front View of Fore-quarters, Showing Different Bad Conformations.

Explanation.—On page 191 the upper left hand figure shows the legs fair to the knee, but from thence down, bad, and with toes turned very much out.

The next figure on the right, is very bad, the knees turned out and the toes turned in; a dangerous horse, and unfit for driving or riding.

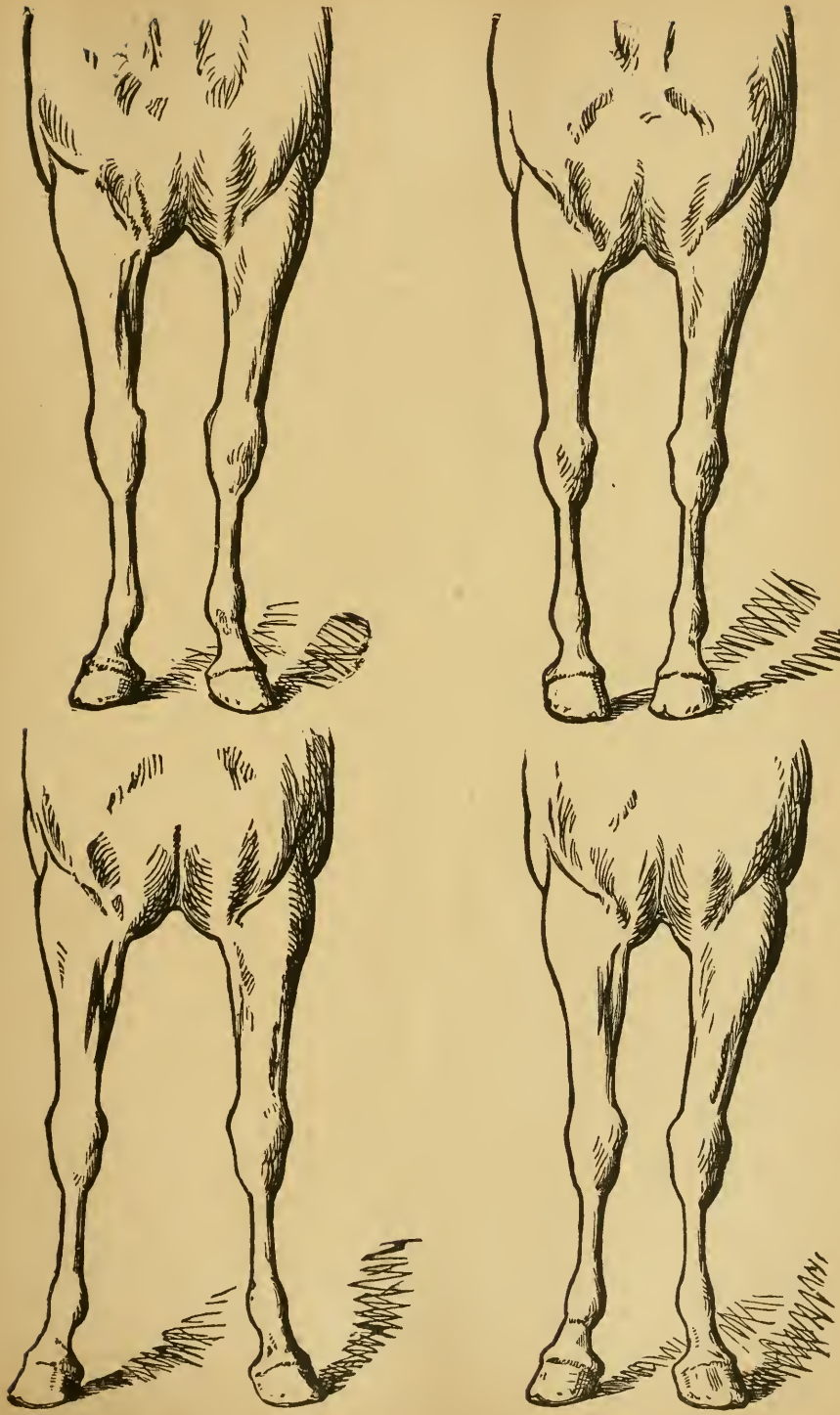
The lower figure to the left is as unsightly as possible; the legs spready, weak, straddling, and with the toes turned out. Such a horse may be tolerably sure-footed, if carefully managed, and not hard-driven, but one never to be depended upon.

The next figure at right of bottom, is bad all over, weak-limbed, knock-kneed and splay-footed. A horse never to be depended upon and unserviceable in the extreme.

Between these there are many gradations, which those who study these pages may profit by examining and comparing with the front view of a perfect shape given on page 187, and which carried fully in mind will go a great way in enabling one to form a pretty accurate opinion in buying a horse.

XII. The Hind-quarters.

It has been said that the fore-quarters of a horse are simply to hold him up, while the hind-quarters propel the machine. This in a sense is true, but a horse, however good his hind-quarters be, must not only have the fore limbs good enough to hold him up, but to keep him out of the way of the hind feet, and at the same time assist in propelling the body. In fact, the whole animal should be composed of parts working harmoniously together, each assisting the other while doing its own work;



FRONT VIEW OF FORE-QUARTERS, SHOWING DIFFERENT BAD CONFORMATIONS.

nevertheless the hind-quarters are the propelling power, especially when under the gallop. For then the motion is communicated by a succession of leaps, acting more in the nature of a balance than in walking or in

GOOD HIND-QUARTERS. (*See Explanation.*)

trotting. In order that the hind-quarters may do their work effectively, there must be a strong loin, ample and muscular quarters, great length

of hip, strong, dense bones, sinews like whip-cord, strong joints and flat and wide legs.

In order to determine this the purchaser should observe first, looking at him from the side, whether he stands resting perpendicularly on every leg alike. The legs should not be straddled outside of their true position, neither should they be gathered together, or in horse-men's phrase, as though he were trying to stand in a half bushel. He should stand straight, square, and distinctly on every leg. If he stands with the hind legs behind their true position, induce him to move his fore legs forward, to find if such a position gives him ease. Examine him as before stated for splints, damaged back sinews, ring-bones or side-bones in the fore limbs; and in the hinder ones for bone blood or bog spavins, curbs or thorough pin, as previously described. If he stands as in the figure given on page 192, and if he is free from blemish, one may go a long way to find a better.

Examine especially whether the pasterns, outline of the hock joints, are nearly perpendicular or angular, or whether they present a convex curvilinear protuberance just above the union of the shank bone. If not there will be little danger of curb, or a tendency to throw them out. If the hocks are drawn in the horse will appear cow-hocked, a malformation as serious as it is ungainly, for thus the animal will be weak. If the hind-legs are wide apart and the horse straddles in going forward, while it may not weaken his stride it is not elegant. However true it be that some fast and strong trotters straddle—as going wide is termed—this should be avoided. The illustration on page 192 will show accurately good hind-quarters, as those on page 194 will show bad ones.

On page 194 the figure at the upper left side would be called fine and in every way good to the inexperienced buyer. The buttocks are round but lack character, and the legs are too straight and far behind.

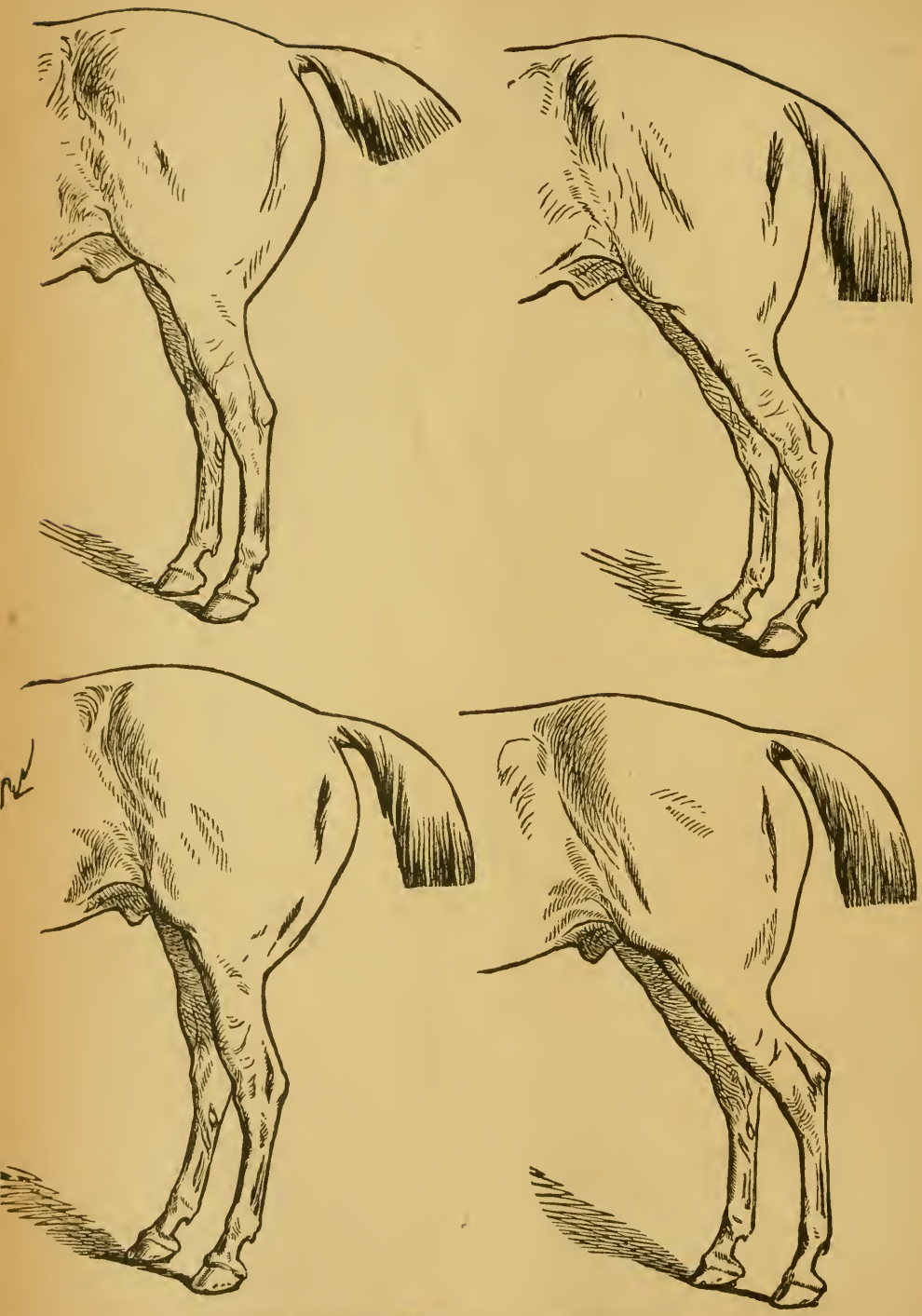
The figure to the right is bad in every respect—goose-rumped, cat-hammed, with the legs thrown far back to equalize the strain; the ankles also weak.

The figure to the lower left on same page shows a fair quarter, but the legs are thrown too far forward, and the animal stands too straight on the pasterns.

The figure to the right is really not badly formed as to the quarter, but the position is cramped and bent, and the limbs badly placed.

XIII. The View from Behind.

The view of the horse as seen from behind should show good square quarters, full and perfectly shaped *gracilis*, as those muscles are called

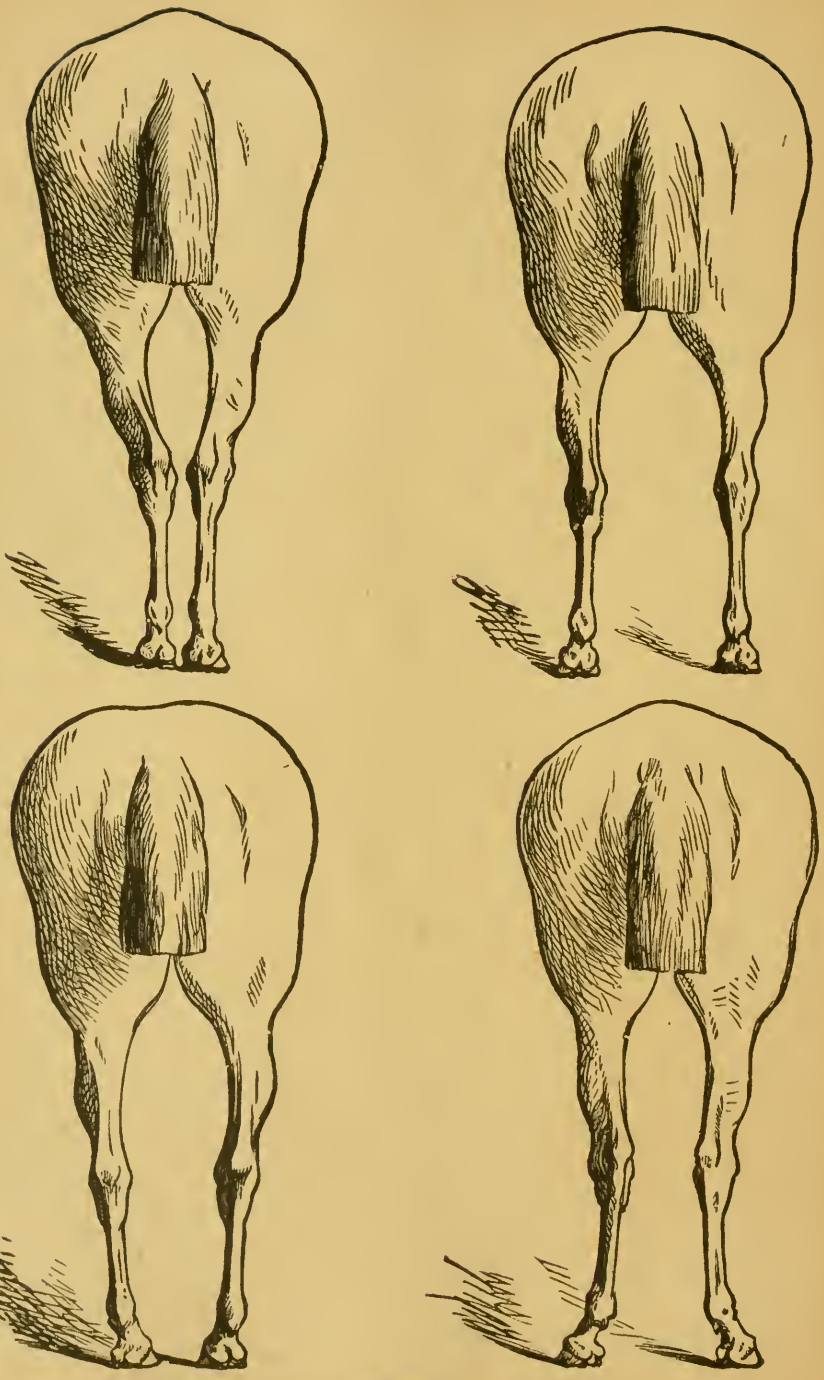


SIDE VIEW OF HIND QUARTERS—BAD. (*See Explanation*).

which give the peculiar swelling shape to the inside of thigh. These should be egg-shaped, or rather should swell from nearly a point below and then gradually decrease in size till lost to view near the rump bone.

BACK VIEW OF HIND QUARTERS—GOOD. (*See Explanation*).

The outside muscle of the tibia, or great bone of the leg above the knee, cannot well be too large. The tendons connecting with the hocks



BACK VIEW OF HIND-QUARTERS—BAD. (See Explanation).

should be strong and well presented to view. The hocks large, firm, strong and well knit, but smooth and free from blemish, as should be the fetlock joints. If the horse is flat-footed he has a weak hoof, which should never go with a strong muscular horse.

When the animal moves forward, observe that the feet are lifted squarely, carried straight forward, without turning or straddling. If so, and the conformation is as presented in the rear view of the horse on page 195, then if you have attended minutely to the other directions, and the movement is satisfactory, you need not fear to buy the horse. He will not fail you in time of need.

As showing defects, in various gradations and malformation in the hind-quarters, we refer the reader to the figures on page 196, a study of which will enable the observer to steer clear of splay-footed, pigeon-toed, bow-legged or cow-hocked brutes.

XIV. What Not to Buy.

Never buy a horse unbroken or half broken, unless you are thoroughly competent to train him, or else have some one to do so on whom you can depend. Never buy a horse overloaded with fat, expecting him to remain so under work. The first thing to be done with such a horse is to get him rid of the superfluous fat and water. This takes time and takes money. Besides you never can know the real defects of a horse "very fat." An ox or a hog perfectly fattened, is pleasing to the eye. They are intended for succulent joints and steaks, or for hams, bacon, or pickled pork. A fat horse, except before the close coach of some wealthy and aged spinster or widow, is woefully out of place.

Never buy a horse because he is big, unless you want him for slow and heavy draft. Light horses are for light driving. A horse weighing eleven hundred is heavy enough for ordinary driving, and generally better than a heavier one. A pair of horses weighing twenty-four hundred pounds is good enough for any ordinary work that comes, and heavy enough for any city teaming, except when wanted as show horses before some brewer's wagon, or as horses of slow draft on heavy trucks.

Don't buy a cheap horse, expecting perfection. The two never yet went together. Perfect horses are not so plenty. Indeed they are so scarce as to be entirely beyond the means of any except the very wealthy. They are seldom seen even among this class. In fact perfection lies only in degree. A horse may be measurably perfect for our purpose, and yet quite defective for others. Therefore buy a horse for what you want, and expect to pay the honest price for what you get. Again, unless you

are a judge, buy of some dealer who has a reputation to lose, and the means to back up any guarantee he may make.

XV. Buying for Blood.

In buying for fast work, buy blood every time, whether the work desired is to be trotting to the wagon or carrying the owner under the saddle.

In buying blood, as a breeder, whether stallion or mare, never fool away any money on a half or three-quarters bred sire, expecting to get high caste horses. With a staunch thorough-bred of trotting action, you may successfully breed good trotters and workers on mares of cold blood, if they be of good size and form and are roomy. But for racing do not expect a cold-blooded mare to bring a very fast one, however good the size, except it may be by chance, and a rare chance at that.

In breeding for any purpose select the best of the class. Staunch thorough-breds for fast work; handsome thorough-breds for show horses.

For draft select from families that have been bred for generations for this work. Above all do not buy horses and mares that happen to strike your fancy, expecting to start a *new breed*. Life would be all too short. It would be far more sensible to begin where the last man left off.

CHAPTER XII.

RACING, OR TURF HORSES.

EARLY HISTORY OF THE ENGLISH BLOOD HORSE. —— HOW HE WAS IMPROVED. —— THE AMERICAN BLOOD HORSE. —— CELEBRATED AMERICAN HORSES. —— HISTORY OF THEIR PERFORMANCES.

The care taken in the breeding and training of horses for the chase and for racing in Great Britain, extends back, according to the best authority, to long before this people were converted to Christianity; in fact, to long before the Christian Era.

Just when and how horses were introduced into Great Britain is not certain, but it seems clear that they were well known there long before the Roman conquest, and that they bred horses not only for domestic purposes but also for war and for racing, seems true, from words in the ancient British language, as *rhediad*, a race; *rheda*, to run—from the Gaulish language *rheda*, a chariot, showing that these words applied to the racing of horses. Hence the inference that horses came by way of Gaul, and that chariot races were anciently one of the pastimes of the people.

The Romans found different vehicles in use in Britain, including the war chariot. Youatt infers that from the cumbrous structure of the car, the hardness of the roads, and the furious manner in which the driving was done, that the ancient British horses must have been not only active, but powerful in a wonderful degree; and he says that Cæsar thought them so valuable that many of them were carried to Rome, where they were much esteemed.

After the evacuation of England by the Romans and its occupation by the Saxons, increased attention was paid to the breeding of English horses, and after the reign of Alfred running horses were brought there

from Germany, yet these should not be understood as meaning racing horses as the term is now used. They are supposed to have been light, speedy horses, adapted to the chase or for the roads, as opposed to the heavy war horse, capable of carrying a man at arms with his armor.

It does not appear that until the time of Charles I. horses were kept exclusively for racing. Yet even before Athelstan's time English horses had come to be prized on the continent, and in Athelstan's reign many Spanish horses were imported, showing clearly that so long ago as this the English were fully alive to the importance of the continued improvement of their horse stock.

William the Conqueror is recorded to have used great pains in improving the horse stock of the country, after the conquest of Great Britain by the Normans, through the introduction of fine horses from Normandy, Flanders and Spain, and according to Beal it would seem that as early as 631 people of rank distinguished themselves by often appearing on horseback, and from which it would be natural to infer that thus early horses were kept for pleasure riding, since saddle horses are known to have been used during the Roman occupation of Britain, and cavalry horses long before the Christian Era.

The first Arab horse would seem to have been imported in the reign of Henry I., an Arab horse having, with his accoutrements, been presented by Alexander I. of Scotland, to the church of St. Andrew.

In the twelfth century a race course was established in London, at what was since called Smithfield, and which was also a horse market.

King John paid great attention to the importation of horses; one hundred chosen Flemish stallions having been imported at a single time. Later it is recorded of Edward II. that he purchased thirty war horses and twelve heavy draft horses.

Edward III., upon the occasion of buying fifty Spanish horses, made application to France and Spain for safe conduct for them, and so important was the horse stock of England considered that the exportation of stallions was forbidden, and this prohibition was continued up to and during the reign of Henry VII.

In the reign of Henry VIII. it was decreed that no stallion should be allowed to run at large on any waste or common where animals pastured, if under the height of fifteen hands, and that all foals, fillies or mares likely to breed undersized or inferior animals, should be killed and buried.

All the nobility, gentry and higher orders of the clergy, were compelled by an act to keep a number of horses proportioned to their rank, and even a country parson, whose wife was entitled to wear a French hood or velvet bonnet (no person below a certain rank being allowed to wear such

a hood) was obliged to keep an entire trotting stallion, under a penalty of twenty pounds sterling. So, also, it was made compulsory that every deer park and rural parish should maintain a certain number of full-sized mares and stallions. It is also interesting, as being the first mention made in English history, that Henry VIII. and Charles Brandon, Duke or Suffolk, rode a race in the presence of Queen Catharine, and that in his reign the first annual races on a regular race course were instituted.

H. W. Herbert, in his work, The Horse of America, thus sums up the whole matter in relation to the value of Oriental blood in England, in the time of Oliver Cromwell:

It is now pretty generally admitted that, whether Barb, Turk, Syrian, or Arab of the desert proper, all oriental blood has had its share and influence in reinvigorating the blood of the English thoroughbred, and giving to it those peculiar qualities which cause it, with justice, at this day, to be esteemed the best, completest, and most perfect animal in the world.

In what degree these animals have ministered to our now dominant strain, is by no means to be ascertained; but it is to be noted that most of the early imported foreign stallions were not Eastern Arabs.

During the protectorate, Oliver Cromwell, who, though he was compelled by the necessity of conciliating the absurd prejudices of the Puritans, to forbid racing, was yet an ardent lover of the horse, and an earnest promoter and patron of all that belongs to horsemanship, purchased of Mr. Place, afterwards his stud-master, the celebrated "White Turk"—still recorded as the most beautiful south-eastern horse ever brought into England, and the oldest to which our present strain refers. To him succeeds Villiers, Duke of Buckingham, his Helmsley Turk, and to him Fairfax's—the same great statesman and brave soldier, who fought against Newcastle at Marston—Morocco Barb.

And to these three horses it is that the English race-horse of the old time chiefly owes its purity of blood, if we except the royal mares, specially imported by Charles II., to which it is—mythically, rather than justly—held that all English blood should trace.

Of all succeeding importations, those, which are principally known and referred to, as having notoriously amended our horse—by proof of stock begotten of superior qualities, and victorious on the turf through long generations—but few are true Arabs.

We have, it is true, the Darley Arabian, the Leeds Arabian, Honeywood's White, the Oglethorpe, the Newcome Bay Mountain, the Damascus, Cullen's Brown, the Chestnut, the Lonsdale Bay, Combe's Gray and Bell's Gray Arabians; but what is generally called the Godolphin Arabian, as it seems now to be the prevailing opinion—his origin not being actually

ascertained—was a Barb, not an Arab from Arabia proper. Against these, again, we find Place's White Turk, D'Arcey's Turk, the Yellow Turk, Lister's, or the Straddling Turk, the Byerly Turk, the Selaby Turk, the Acaster Turk; Curwen's Bay Barb, Compton's Barb, the Thoulouse Barb, Layton's Barb Mare, great-great-grandam of Miss Layton; the Royal Mares, which were Barbs from Tangier, and many other Barb horses, not from the Eastern desert, heading the pedigrees of our best horses.

In this connection, I would observe that the very reasons for which the Marquis of Newcastle condemned the Markham Arabian—viz., that when regularly trained he could do nothing against race-horses—on account of which condemnation he has received a sneer or a slur from every writer who has discussed the subject, are those which, at this very moment, prevent prudent breeders from having recourse to oriental blood of any kind.

They cannot run or last against the English horse. They have not the size, the bone, the muscle, the shape, if we except the beautiful head, fine neck, thin withers, long, deep and sloping shoulders, which are the inevitable characteristics of the race. Therefore, all men who breed with an eye to profit,—and howsoever it might have been in the olden times of the Turf, there are few now who have not an eye to it, either as hoping to win on the turf, or to produce salable stock—prefer to put their mares to known English winning horses, proved getters of winners, of unquestioned bottom and stoutness, rather than to try stallions of the desert blood, concerning which nothing is known beyond the attested pedigree, and the visible shapes.

Farther our authority gives a list of all foreign, and the most celebrated native stallions which were used for covering in England in 1730, or just 150 years ago. They are as follows:

FOREIGN STALLIONS IN 1730.

The Alcock Arabian, the Bloody Buttocks Arabian, the Bloody Shouldered Arabian, the Belgrade Turk, the Bethel Arabian, Lord Burlington's Barb, Croft's Egyptian horse, the Cypress Arabian, the Godolphin Arabian, Hall's Arabian, Johnson's Turk, Litton's Arabian, Matthew's Persian, Nottingham's Arabian, Newton's Arabian, Pigott's Turk, the Duke of Devonshire's Arabian, Greyhound, a Barb, Hampton Court grey Barb, Strickland's Arabian, Wynn's Arabian, Dodsworth, a Barb

NATIVE STALLIONS IN 1730.

Aleppo, Almanzer, Astridge Ball, Bald Galloway, Bartlet's Childers, Basto, Bay Bolton, Blacklegs, Bolton Starling, Bolton Sweepstakes, Cartouch, Chaunter, Childers, Cinnamon, Coneyskins, Councillor, Crab, Doctor, Dunkirk, Easby Snake, Fox, Foxcub, Græme's Champion, Grey

Childers, Grey Crofts, Hampton Court Childers, Harlequin, Hartley's Blind Horse, Hip, Hobgobling, Hutton's Blacklegs, Hutton's Hunter, Jewtrump, Jigg, Lamprey, Leedes, Marricle Oysterfoot, Partner, Royal, Shuffler, Skipjack, Smale's Childers, Soreheels, Squirrel, Tifter, True-blue, Woodcock, Wyndham.

The importation of racing horses was, without doubt, first made to America in Virginia and Maryland. Already had race-courses been established there previous to 1753, and during the exodus from England, of the Royalists, to the South, it is undoubtedly true that they brought with them descendants of such horses as were covering with success in England. Certain it seems that quite early in the eighteenth century there were a considerable number of thoroughbred horses from the most celebrated English sires. That the perfect record has not come down to us is probably due to the fact that, during the Revolutionary war the records were either lost or destroyed between the shock of contending armies.

Spark was owned by Governor Ogle, of Maryland, previous to Braddock's defeat, having been presented to him by Lord Baltimore, who himself received him as a gift from the then Prince of Wales, father to George III. Spark was a most celebrated horse, and probably one of the first of high distinction brought to America.

Other celebrated horses early imported are said to have been, Wilkes' old Hautboy mare, afterward known as Miss Colville. Governor Ogle also imported Queen Mab, and about 1750 Col. Tasker brought to Maryland the celebrated mare Selima, the progenetrix of much of the mightiest blood of the country. In 1752 he won a sweepstake of 500 pistoles, beating Col. Byrd's renowned Tryall, Col. Taylor's Jenny Cameron, and a mare owned by Col. Cameron.

Nearly about the same time, there were imported into Virginia, Routh's Crab, by old Crab, dam by Counsellor, daughter of Coneyskins, supposed to be in or about 1745. In 1747, Monkey, by the Lonsdale Bay Arabian, dam by Curwen's Bay Barb, daughter of the Byerly Turk and a Royal mare. He was twenty-two years old when imported, but left good stock. In 1748, Roger of the Vale, afterwards known as Jolly Roger, by Roundhead, out of a partner mare, Woodcock, Croft's Bay Barb, Dicky Pierson, out of a Barb mare. Roundhead was by Flying Childers, out of Roxana, dam of Lath and Cade, by the Bald Galloway, out of a daughter to the Acaster Turk. Woodcock was by Merlin, out of a daughter of Brimmer. Dickey Pierson by the Dodsworth Barb out of the Burton Barb mare.

In about 1764, was imported Fearnought, got by Regulus out of Silvertail by Whitenose, grand-dam by Rattle, great grand-dam by the

Darley Arabian, great great grand-dam Old Child mare, by Sir Thomas Gresley's Arabian, great great great grand-dam, Vixen, by Helmsley Turk, out of Dodsworth's dam, a natural Barb. Regulus was by the Godolphin Barb, dam Grey Robinson by the Bald Galloway, grand-dam by Snake out of Old Wilkes' Hautboy mare. Rattle was by Sir H. Harpur's Barb out of a Royal mare. Whitenose was by the Hall Arabian out of dam to Jigg. Thus Fearnought is come of the very highest and purest blood in England, and has left his mark largely on the blood-horse of Virginia. It is said that, before his time, there was little beyond quarter racing in Virginia, that his progeny were of uncommon figure, and first introduced the size and bottom of the English race-horse into America. This must be taken, however, *cum grano salis*, as it is evident from what has been stated in regard to Selima, that four-mile racers were the fashion in Maryland at least fifteen years before that date, and it is only to be understood in the case of second-rate racers, that quarter running was in vogue at this period.

These capital horses were shortly followed by Morton's Traveller, who was probably got by Partner, a grandson of the Byerly Turk, and grandsire of King Herod, dam by the Bloody Buttocks Arabian; grand-dam by Grey-hound, a Barb; g. grand dam by Makeless; g. g. g. dam by Brimmer; g. g. g. g. dam by the White Turk; g. g. g. g. g. dam by Dodsworth, a Barb; g. g. g. g. g. g. dam Laydon Barb mare.

Makeless was by the Oglethorpe Arab out of Trumpet's dam. She was a pure Barb by Dodsworth out of the Layton Barb mare. Brimmer was by the Yellow Turk out of a royal mare.

These were probably the best early horses that were imported into America; and to these, with the mares Selima, Queen Mab, Jenny Cameron, Kitty Fisher, Miss Colville, and a few others of about the same period, may be traced all, or almost all the families of running horses now existing in the United States, in a greater or less degree, and with nearly as much certainty as the English champions of the olden day may be followed up to imported Arab and Barb on both sides.

This being most interesting history, we quote from The Horse of America, to show how much the United States is indebted to the South for the foundation of its mighty racers of the present day, and owing undoubtedly to the great interest the old planters of the South and their descendants have taken in field sports. The record is as follows:

In Virginia, Col. John Tayloe, Messrs. Hoomes, Selden and Johnson; in Maryland, Governors Ogle, Ridgely, Wright, Lloyd and Sprigg, who, as it has been remarked, seemed by their practice to acknowledge that the keeping up of a racing stud was a portion of their gubernatorial duty; and in South Carolina, Messrs. Hampton, Washington, McPher-

son, Alston and Singleton, were as early, and have continued to be as constant and undeviating patrons of the American turf, as have the Queensburys, Rutlands, Wyndhams, Bentincks, Fitzwilliams, and other equally renowned turf names, been supporters of this noble sport on the old English greensward.

From so early a date as that of the ante-revolutionary cracks and champions, such as Celer, Traveller, Yorick, Tryall, Ariel, Partner, Marc Antony, Regulus, Flag of Truce, Goode's Brimmer, Butler's Virginia Nell, Bel Air, Calypso, Gray Diomed, Cincinnatus, Virago, Shark, Black Maria, by Shark, Leviathan, Gallatin, Fairy, Cup-bearer, Collector, Amanda, Ball's Florizel, Post Boy, Oscar, Hickory, Maid of the Oaks, Bond's First Consul, Sir Archy, Potomac, Pacolet, Duroc, Hampton, Tuckahoe, and others, the names of which alone would fill a volume, we can easily bring down in these States—and the others colonized from them, both with men and horses, such as Kentucky, Tennessee, and more recently Alabama—one uninterrupted and stainless succession of noble racers, to the day when the descendants of Sir Archy, that veritable Godolphin Arabian of the Turf of America, began to show upon the course—and when the renown of American Eclipse began to call the attention of the whole world, and of the mother country most of all, whence was derived that transcendent stock, which in all other countries has degenerated, but in this has continued to rival the honors of its remotest ancestry by the performance of American race horses.

As being of value, we give also the history and pedigrees of some of the most celebrated horses of the days succeeding the revolutionary war. They are:

First Medley—Imported into Virginia in 1783, by Gimcrack, dam Arminda by Snap, out of Miss Cleveland by Regulus; g. gr. dam Midge, by a son of Bay Bolton; g. g. gr. dam by Bartlett's Childers; g. g. g. gr. dam by Honeywood's Arabian; g. g. g. g. gr. dam the dam of the two True Blues. Gimcrack was by Cripple, out of Miss Elliott, by Grisewood's Partner, gr. dam Celia by Partner, g. gr. dam by Bloody Buttocks, g. g. gr. dam by Greyhound, g. g. g. gr. dam Brocklesby Betty.

Cripple was by the Godolphin Arabian, out of Blossom by Crab, gr. dam by Childers out of Miss Belvoir, by Grantham.

Medley was one of the best sires ever imported into America. He got Atalanta, Bel Air, Boxer, Calypso, Gray Diomed, Gray Medley, Lamplighter, the Opossum Filly, Pandora, Quicksilver, Virginia, and others—racers in a high form, and themselves the getters of racers.

Second Shark—Foaled in 1771, and imported into Virginia by

Marske, out of the Snap mare, gr. dam Wag's dam, by Marlborough, out of a natural Barb mare.

Marske, sire of Eclipse, was by Squirt, dam by Foxcub, gr. dam by Coneyskins, g. gr. dam by Hutton's Gray Barb.

Squirt was by Bartlett's Childers, dam by Snake, gr. dam Hautboy. Marlborough was by the Godolphin Arabian, dam large Hartley mare.

Shark's most distinguished progeny are: Americus, Annette, Black Maria, dam of Lady Lightfoot, Opossum, Shark, Virago, and many others.

Third Diomed—Foaled in 1777. Imported into Virginia 1798. He was by Florizel, dam by Spectator, gr. dam by Blank, g. gr. dam by Childers, g. g. gr. dam Miss Belvoir, by Grantham.

Florizel was by Herod, dam by Cygnet, gr. dam Cartouch, g. gr. dam Ebony by Childers, g. g. gr. dam old Ebony Basto mare.

Herod was by Tartar, out of Cypron, by Blaze, out of Selima, &c. &c.

Diomed is probably the greatest sire of the greatest winner-getters ever brought into this country. Had he got none but Sir Archy, out of imported Castianira—who brought him to America in her belly—that renown alone would have been more than enough; for scarce a recent horse in England, unless it be Pot8o's, has so distinguished himself as a progenitor.

He begot Bolivar, Diana, Dinwiddie, Duroc, Florizel, Gallatin, Gracchus, Hamlintonian, Hampton, Hornet, King Herod, Lady Chesterfield, Madison, Marske, Nettle-top, Peace-maker, Potomac, Primrose, Sir Archy, Top-gallant, Truxton, Virginius, Wonder, and many others. Most of the horses named above were the greatest runners of their day, and the getters of the greatest racers and sires to the present time. Boston, probably the very best horse that ever ran on American soil, was by Timoleon, grandson of Sir Archy, the best son of Diomed; while Fashion, the very best mare that ever ran on this side the water, by her dam, Bonnets of Blue, daughter of Reality, was great-granddaughter of that same noble stallion; and by her grandsire Sir Charles, sire of Bonnets and son of Sir Archy, was also his great-granddaughter, a second time, in the maternal line.

Fourth Gabbriel—Foaled 1790, imported into Virginia, was got by Dorimant, dam Snap mare, gr. dam by Shepherd's Crab, g. gr. dam, Miss Meredith by Cade, g. g. gr. dam Little Hartley mare.

Dorimant was by Otho, dam Babraham mare, gr. dam Chiddy by Hampton Court Arabian, out of the Duke of Somerset's Bald Charlotte.

Otho was by Moses, dam Miss Vernon by Cade, gr. dam by Partner, g. gr. dam Bay Bloody Buttocks, g. g. gr. dam by Greyhound, g. g. g. gr. dam by Makeless, g. g. g. g. gr. dam by Brimmer, g. g g. g. g. gr.

dam by Place's White Turk, g. g. g. g. g. g. gr. dam by Dodsworth, g. g. g. g. g. g. g. gr. dam Layton's violet Barb mare.

Moses was by the Chedworth Foxhunter, dam by the Portland Arabian, gr. dam, the dam of the Duke of Bridgewater's Star, she by Richard's Arabian.

Gabriel was brought into Virginia, and became, like the preceding horses, very famous for splendor of his get and their great performances. He got Oscar, Post Boy, and others. The former of whom, dam by imp. Medley, bred by General Tayloe, is his most celebrated son. He was a good runner, and his blood tells in many of our best modern stallions and mares, especially in the Southern States.

Fifth Bedford—Foaled in 1792, imported into Virginia. He was got by Dungannon, dam Fairy, by Highflyer, gr. dam Fairy Queen by Young Cade, g. gr. dam Routh s Black Eyes by Crab, g. g. gr. dam the Warlock Galloway, g. g. g. gr. dam by the Byerly Turk.

Dungannon was by Eclipse out of Aspasia, by Herod, gr. dam Doris by Blank, g. gr. dam Helen by Spectator, g. g. gr. dam Daphne by the Godolphin Arabian, g. g. g. gr. dam by Fox, g. g. g. g. gr. dam by Childers, g. g. g. g. g. gr. dam by Makeless, g. g. g. g. g. g. gr. dam, Sister to Honeycomb Punch, by the Taffolet Barb.

The year of Bedford's importation is not exactly known. He was a great stallion, and there is hardly a family of horses in the Southern States which do not in some degree, more or less, partake of his blood. He was a singularly formed horse—a rich bay—with a peculiar elevation on his rump, amounting in appearance to an unsightliness, if not to an absolute deformity. This mark, known as the Bedford Hump, he has transmitted to his posterity, and, whatever may have been the original opinion as to its beauty, it has been worn by so many celebrated winners, that it has come of late to be regarded as a foreshadowing of excellence, rather than a deformity. It has been worn by Eclipse, Black Maria, her brother, Shark, Boston, Argyle, and many other horses of great note.

Bedford got; Æolus, Cup-Bearer, Fairy, Lady Bedford, Lottery, Nancy Air, Shylock and others not inferior in repute.

On the first settlement in Tennessee, previous to its admission as a State into the Union, the early settlers began taking with them excellent stock from Virginia and Maryland, and the blood of Janus, Jolly Roger, Morton's Traveller, Pacolet and other worthies of the olden times, still percolates in rich luxuriance through the veins of their noble steeds. It has been always a gallant and a sporting State; and I feel proud and happy—the rather that the history of the blood stock of Tennessee and of the neighboring State of Kentucky is nearly identical—to be allowed the opportunity of presenting to my readers a most valuable memoir of

the blood of its best equine families, considerately and kindly compiled for me from his own memoranda of old times, and from personal recollection of events, even before General Jackson and his contemporaries were on the turf, by a veteran turfman and a hereditary breeder, Mr. William Williams—to whom I take this occasion of tendering my most grateful and respectful thanks.

Race Horses at the North.

Prior to the Revolution there was a course for racing, near New York, about the centre of the county, called Newmarket, and one at Jamaica called Beaver Pond. As early as the year 1800 courses were established at Albany, Poughkeepsie and Harlem, New York. On these tracks purses of from one to four miles were contended for. In 1804 an organization was formed extending for five years. The Newmarket course was remodeled, and regular races were held in May and October of each year, at which purses were contended for at four, three and two mile heats.

Among the celebrated horses of that time, some of which have left their impress to this day, were Tippoo Sultan, Hambletonian, Miller's Damsel and Empress. Among these, as worthy of especial mention, were Hambletonian, as the progenitor of mighty trotting stock, Miller's Damsel as the dam of American Eclipse, and Ariel, whose granddam was this gray mare Empress. American Eclipse was the king of the American turf of his day, and Ariel may certainly be said to have been the queen, since out of fifty-seven races she was forty-two times the winner, seventeen of them having been four mile heats. They both of them may be said to rank with the best race horses of any age or country.

The pedigree of Eclipse may be summed up in the language of Frank Forrester, as follows: American Eclipse, bred by Gen. Coles of L. I., foaled 1814; was got by Duroc, his dam the famed race mare Miller's Damsel, by imported Messenger, out of the imported Pot8os mare; her dam by Gimcrack. Duroc, bred by Wade Mosely, Esq., of Powhatan county, Virginia, foaled 1809: was got by imported Diomed, out of Mr. Mosely's "extraordinary race mare Amanda," by Col. Tayloe's famed gray Diomed, son of imported Medley. Thus far Eclipse's pedigree is unquestioned; for the balance see American Turf Register, p. 50, vol. 4. Of Sir Charles Bunbury's Diomed, imported into Virginia 1799, having filled the measure of his glory," nothing more need be said. Messenger, foaled 1788, imported about 1800 into Pennsylvania, was also a race horse of repute at Newmarket; he won some good races, and lost but few. He was a gray, of great substance; was got by Mambrino, a very superior stallion, his dam by Turf, son of Matchem, Regulus—Starling—Snap's dam. See English Stud Book, and American Eclipse's pedigree in full, American Turf Register, p. 51, vol. 4.

Of Ariel we find the following: Ariel's pedigree is worthy of her performances. Her own brothers—Lance, a year older than herself, a distinguished runner that beat the famous Trouble, a great match—O'Kelly, that beat Flying Dutchman, Mary Randolph, and others, with such eclat as to bring $5,000—and St. Leger in the great sweepstake in Baltimore, where he was so unaccountably beaten, but has since beat Terror—her own sister Angeline, and half-brother Splendid, by Duroc, that was beaten at three years old, in a produce match, by Col. Johnson,s Medley—are all well known to fame. Her grandam Empress, has also been regarded one of the most renowned race nags and brood mares of the North. October, 1804, at four years old, she very unexpectedly beat the famous First Consul, for the Jockey Club purse, four-mile heats, at Harlem, N. Y. The first race he lost.

Besides combining the three valued crosses of Herod, Matchem, and Eclipse, it will be observed Ariel's pedigree is "richly imbued with the best English blood;" to which she traces almost directly from Childers, Partner, Crab, Snap, Cade, Spark, Othello, Gimcrack, Mambrino, Medley, Pot8os, Messenger, Baronet, Diomed, &c.; besides deriving her decent from the best early importations. No other stock probably partakes so much of the Messenger blood—no less than four crosses; with two, not very remote, from English Eclipse, two from Gimcrack, two from imported Pacolet, and three from imported Spark. Her color sustains her valuable origin—running so much into the Arabian blood.

Black Maria was another of the wonderful performers of the early part of the century, having been bred by Charles Henry Hall, Harlem, N. Y., and foaled June 15, 1826. She was sired by American Eclipse, dam Lady Lightfoot by Sir Archy, gr. dam Black Maria, by imported Shark; g. gr. dam the dam of Ving't un, by Clackfast, a half-brother to Medley, by Gimcrack; g. g. g. dam Burwell's Maria, by Regulus.

Of her dam, Lady Lightfoot, Frank Forrester says she was the most distinguished racer of her day, having won between twenty and thirty races, the majority at four-mile heats, and never having been beaten but once, except in her old age—her eleventh year—and then by Eclipse, on the Union Course. She was bred by the late Col. John Taloe of Va. and was foaled at Mr. Ogle's seat, Bel-air, Md., in June, 1812.

Among the wonderful racers of forty years ago, Boston and Fashion will always be remembered as the two mighty examples of staunch prowess and well-deserved fame.

Boston was foaled in 1833, bred by John Wickham, Esq., Richmond, Va. His sire was the celebrated Timoleon, out of an own sister of Tuckahoe, by Ball's Florizel; her dam by imported Alderman, out of a mare by imported Clackfast; her gr. dam by Symmes' Wildair, &c.

He was a chestnut with white hind feet and a strip in his face, 15 1-2 hands high, rather short limbed, somewhat flat sided, but of immense substance, and his back a prodigy of strength. From 1836 to 1841 he ran thirty-eight times and won thirty-five races, twenty-six of which were four mile heats and seven three mile heats. His winnings were $49,500, and his earnings as a breeding stallion in 1841, $4,200, making a total of $53,700.

Fashion was bred by William Gibbons, Esq., of Madison, N. J., and was foaled April 26, 1837. Of this mare it is recorded that it would be difficult to sit down over the Stud Book and compile a richer pedigree than hers, and the same remark will apply to Boston. Each is descended from the most eminently distinguished racing families on the side of both sire and dam, that have figured on the Turf for a hundred years. Fashion was got by Mr. Livingston's Imp. Trustee, out of the celebrated Bonnets o' Blue by Sir Charles, and she out of Reality—"the very best race-horse," says Col. Johnson, "I ever saw." Reality was got by Sir Archy, and her pedigree extends back through the imported horses Medley, Sentinel, Janus, Monkey, Silver-Eye and Spanker, to an imported Spanish mare. Trustee, the sire of Fashion, was a distinguished race-horse in England, and sold at 3 yrs. old for 2,000 guineas to the Duke of Cleveland, after running 3d in the race for the Derby of 101 subscribers. He was subsequently imported by Messrs. Ogden, Corbin and Stockton. Trustee was foaled in 1829, and was got by Catton out of Emma, by Whisker, and combines the blood of Hermes, Pipator, and Sir Peter, on his dam's side, with that of Penelope, by Trumpator, and Prunella, by Highflyer, on the side of his sire. Trustee is not a chance horse; in addition to other winners of his family, in 1835, his own brother, Mundig, won the Derby of 128 subscribers.

In her three year old form she won three of the races she ran and lost one, being beaten by Tyler after winning the second heat. In her four year old form she ran and won three races, one at two miles, one at three miles and one at four miles.

Later, the palm of victory rested upon horses bred west of the Alleghanies and south of the Ohio river. Among the celebrated ones were Lexington, got in 1851 by Boston out of Alice Carneal. Lecompte, by Glencoe, out of Reel. Pryor, by Glencoe, out of Gypsy, own sister to Medoc, by American Eclipse.

Still later, and within the last ten years, the laurels of southern bred racers on various tracks in America and England, are too well known to need recapitulation.

As showing English and American views on the speed of race horses of twenty years ago, really the palmy days of the turf, and which con-

tinued up to the late war, Stonehenge, from an English point of view, says:

By an examination of the racing time-tables as recorded of late years, it will be seen that from 13 1-2 to 14 seconds per furlong is the highest rate of speed attained in any of our races, above a mile, and with 8 st. 7 lbs. carried by three-year-old horses. In 1846, Surplice and Cymba won the Derby and Oaks, each running the distance in 2m. 48s., or exactly 14 seconds per furlong. This rate has never since that time been reached; the Flying Dutchman having however, nearly attained it, but failing by two seconds—making his rate 14 seconds and one sixth per furlong. But the most extraordinary three-year-old performance is that of Sir Tatton Sykes over the St. Leger Course, 1 mile, 6 furlongs, and 132 yards in length, which he ran in 3 minutes and 16 seconds, or at a rate of as nearly as possible 13 1-2 seconds per furlong. With an additional year and the same weight, this speed has been slightly exceeded by West Australian, even over a longer course, as at Ascot in 1854, when he defeated Kingston by a head only; running two miles and four furlongs in 4m, and 27s., or as nearly as possible at the rate of 13 1-2 seconds and one-third per furlong. This performance is the best in modern days, considering the weight, the age, and the distance; and it will compare very favorably with the often-quoted exploit of Childers over the Beacon Course in 1721, when, being six years old, he beat Almanzor and Brown Betty, carrying 9 st. 2 lbs., and doing the distance in 6m. 40s., or at the rate of 14 seconds and one-third per furlong. Thus, allowing him his year for the extra mile in the course, and for the 2lbs, which he carried above the Kingston's weight, he was outdone by the latter horse at Ascot by one second per furlong, and likewise by West Australian at the usual allowance for his age. Again; comparing these performances on the English Turf with the recently lauded exploits of the American horses, it will be found that there is no cause for the fear lest our antagonists in the "go-ahead" department should deprive us of our laurels. On the 2d of April, 1855, a time-match was run at New Orleans between Lecomte and Lexington, both four years old, in which the latter, who won, did the four miles, carrying 7 st. 5lbs., in 7m. 19 3-4s., or as nearly as may be, 13 3-4 seconds per furlong. This is considered by the Americans the best time on record, and is undoubtedly a creditable performance; though when the light weight is taken into account, not so near our best English time as would at first sight appear. On the 14th of April, Brown Dick and Arrow ran three miles over the same course in 5m. 28s., or at the rate of 13 seconds and two-thirds per furlong; the former a three-year-old, carrying 6 st. 2 lbs., and the latter five years old, 6 st. 12 lbs. Thus it will appear that Kingston, of the

same age as Arrow, and carrying 9 st. instead of 7 st. 12 lbs., ran 2 1-2 miles at a better rate than Arrow did his 3 miles, by one-third of a second per furlong. And it has been shown that in the year last past, two horses exceeded the greatest performance of the olden times by a second per furlong, and beat the best American time of modern days by one-third of a second per mile. The assertion, therefore, that our present horses are degenerated in their power of staying a distance under weight, is wholly without foundation; since I have shown that, even taking the time of the Childers' performance as the true rate, of which there is some doubt, yet it has recently been beaten very considerably by West Australian and Kingston. Many loose assertions have been made as to the rate of the horse, for one mile in the last century, but there is not the slightest reliance to be placed upon them. That any race-horse ever ran a mile within the minute, is an absurd fiction: and it is out of the question to suppose that if Childers could not beat our modern horses over the Beacon Course, he could beat them a shorter distance. Stoutness was undoubtedly the *forte* of the early race-horses; they were of small size, very wiry and low, and could unquestionably stay a distance, and could race month after month, and year after year, in a way seldom imitated in these days; but that they could in their small compact forms run as fast in a short spin as our modern three-year-olds, is quite a fallacy; and no racing man of any experience would admit it for a moment.

The size and shape of the modern thoroughbred horse are superior to those of olden days, if we may judge by the portraits of them handed down to us by Stubbs, who was by far the most faithful animal painter of the eighteenth century. In elegance of shape we beat the horses of that day very considerably, more especially in the beauty of the head and the formation of the shoulders, which have been much attended to by breeders. In size, also, there has been an immense stride made, the average height of the race-horse having been increased by at least a hand in the last century. This enlargement is, I believe, chiefly due to the Godolphin Arabian, who was the sire of Babraham, the only horse of his time which reached 16 hands, and sire and grandsire of several which were more than 15 hands, much above the average height of horses at that time—as for instance, Fearnought, Genius, Gower, Stallion, Infant, Denmark, Bolton, Cade, Club, Lofty, and Amphion. Indeed it will be found, by an examination of the horses of that time, that out of 130 winners in the middle of the eighteenth century, there were only 18 of the height of 15 hands and upwards, of which 11 were by Godolphin or his sons, three descended from the Darly Arabian, two from the Byerly Turk, and two from other sources. It may therefore be assumed, with some degree of probability, that the increase in size is in great measure

due to the Godolphin, in addition to the extra care and attention which the horse has received during the same time. Nevertheless, all the care and forcing in the world will not increase the size of some breeds; and unless there was this capability of being forced, no amount of attention would have brought the horse to the present average, which may be placed at about 15 hands 3 inches.

In relation to the comparisons of speed between English and American race horses, the *Spirit of the Times*, New Yord, sums up the matter, and gives a list of the most renowned racers of England and America, which we append:

It will appear, on a critical examination of the subject, that there is not much difference in the powers of the best race-horses for more than a century; a period during which they have been brought, upon both sides of the Atlantic, to the present high state of perfection. Within the last two years have been exhibited faster running in England, by West Australian and Kingston, and in this country, by Lexington and Lecomte, than was ever before known. The two last have run four miles, and four-mile heats, faster, in either case, than has been performed in England. "Stonehenge," who has been well endorsed in England, has shown "the absurd fiction" of "a mile within a minute;" and that there is "not the slightest reliance to be placed upon the many loose assertions" —such as the reported accounts of Childers; and that he and Eclipse were a distance better than any other horses that have appeared, or that they "could beat any other a half-mile in four miles!" On the same authority, it appears that, in the fastest Derby, St. Leger, and Ascut cup races, as won by Surplice, the Flying Dutchman, Sir Tatton Sykes, Don John, and West Australian, the distance varying from one mile and a half to two miles and a half, that the fastest rate, with English weights, has been a little over one minute and forty seconds per mile. We have no authentic report that the mile has been run in England under one minute and forty-two seconds, the time of Henry Perritt at New Orleans. Nominally of the same age, three years old, and with the same weight, 86 lbs., Inheritor, at Liverpool, ran two miles in 3.25; which is at the rate per mile of 1-42 1-2. "Stonehenge," referring to what he considers the best race ever run in England, states that West Australian, four years old, carrying the St. Leger weight, 8 st. 6 lbs.—118 pounds— "defeated Kingston by a head only," the latter five years old, carrying 9 st.—126 pounds—running two and a half miles in 4.27, "or as nearly as possible, 13 1-2 seconds per furlong." "This performance, the best of modern days, considering the weight, the age, and the distance, will compare very favorably with the often quoted exploit of Childers, in 1721, at Newmarket, when six years old, carrying 9 st. 2 lbs.—128 lbs.—

he did the distance, three and a half miles, in 6.40, or at the rate of 1s seconds and one-third per furlong." "Thus allowing Childers his year for the extra mile in the course, and for the two pounds which he carried above Kingston's weight, he, Childers, was outdone by Kingston at Ascot, by one second per furlong, and likewise by West Australian, at the usual allowance for his age." "Kingston, of the same age as Arrow, and carrying 9 st. instead of 6 st. 2 lbs.—100 pounds—ran two and a half miles at a better rate than Arrow, in his race with Brown Dick, did his three miles, by one-third of a second per furlong," But Arrow's was a race of three-mile heats, the second heat in 5.43 1-2. Lexington, nominally four years old, carrying 103 pounds, ran four miles, also at New Orleans, in 7.19 3-4. or, as nearly as may be, 13 3-4 seconds per furlong, at the rate, for four miles, of less than 1.50 per mile.

The often quoted exploit of Eclipse, of England, was that he ran four miles, carrying 168 pounds, in eight minutes.

With these data before them, it is left for others to draw their own deductions of the relative merits of West Australian, Childers, Eclipse, and Lexington, at the distances they ran, varying from two and a half miles to four.

Some among us believe that Lexington and Lecomte were about as fast and as good race-horses as have ever appeared in England. Undoubtedly they could "stay a distance" about as well as any horse that has run anywhere, having run two heats, of four miles, in 7.26, and 7.38, and the third mile of the second heat in 1.47.

It would be difficult to institute a fair comparison between the race-horses of England and America, the systems of racing being so different in the two countries. With the exception of the light weights, adopted by us for convenience, the modes and rules of our turf are nearly the same as they were in England the last century. In England, since that period, the mode of racing has been essentially changed; heavy weights, even for two and three-year-olds, at short distances, rarely beyond two and a half miles; no longer races of heats; the great events being for "baby horses," two and three-year-olds, instead of *horses*, as formerly. They rarely, nowadays, reach maturity in England. Priam, Touchstone, Harkaway, and Rataplan, are to be regarded as exceptions to a rule. Childers and Eclipse were not introduced upon the turf until five years old, an age at which the most distinguished horses rarely run in these days.

The elastic turf and the straighter shape of the English race-courses, better adapt them to speed than our circular "race-tracks," that are wholly denuded of turf. Therefore a fair comparison of English and American race-horses cannot be made by time as the test; one, too, that is not held in as high esteem in England, but is frequently disregarded.

Rather a long catalogue is here presented of the best race-horses of England and of this country, which might be extended. Those now or lately upon our turf are omitted, as some doubts might be entertained of their comparative merits. Of those furnished, who will agree as to the pre-eminence of any two of them; at least, to place any six above the rest?

MOST RENOWNED ENGLISH AND AMERICAN HORSES.

1715*, Childers; 1718*, Partner; 1748*, Matchem; 1749*, Regulus and Mirza, by the Godolphin Arabian; 1749*, Spectator; 1750*, Snap; 1758*, Herod; 1764*, Eclipse, by Marske; 1771*, Shark, by Marske; 1773*, Pot8os, by Eclipse; ——*, Saltram, by Eclipse; 1777*†, Diomed; 1782†, Trumpator; 1784†, Sir Peter; 1790†, Waxy; 1792†, Hambletonian; 1796†, Sorcerer; 1798†, Eleanor; 1798†, Orville; 1807†, Whalebone; 1816, Sultan; 1822, Camel; 1827†, Priam, by Emilius†; 1831†, Plenipotentiary, by Emilius†; 1831†, Touchstone; ——†, Queen of Trumps; ——†, Bay Middleton; ——†, Flying Dutchman; ——, Harkaway; ——†, Don John; ——†, Sir Tatton Sykes; ——†, West Australian; ——, Kingston; 1801*, Florizel; 1812, Potomac; 1813*, Sir Archy; 1812, Lady Lightfoot, by Sir Archy; 1812, Vanity, by Sir Archy; 1813, Reality, by Sir Archy; 1813*, Timoleon, by Sir Archy; 1814, Virginian, by Sir Archy; 1815, Sir Charles, by Sir Archy; 1820, Bertrand, by Sir Archy; 1801, Maid of the Oaks, by Imported Spread Eagle; 1801, Floretta, by Imported Spread Eagle; 1801, Postboy, by Imported Gabriel; 1801, Oscar, by Imported Gabriel; 1801, Hickory; 1808, Duroc; ——, Sir Solomon; 1814, American Eclipse; 1820, Flirtilla; ——, Monsieur Tonson; ——, Sally Walker; ——, Ariel, by American Eclipse; ——Medoc, by American Eclipse; ——, Fanny, by American Eclipse; ——, Lady Clifden; ——, Doubloon, by Imported Margrave; ——, Blue and Brown Dick, by Imported Margrave; 1833, Boston; 1837, Fashion; 1839, Peytona; ——, Trifle, by Sir Charles; ——, Andrew, by Sir Charles; ——, Wagner, by Sir Charles; ——, Grey Eagle.

Another view of the comparative merits of race-horses that were not contemporaries is presented by time on the *same* course, and with the *same* weight, or the relative weight for age.

It has been shown lately, that on the Charleston Course, at three and four-mile-heats, in the races won by Nina, Highlander, Jefferson Davis, and Frank Allen, nearly the same time has been made; besides the comparison between that of Bertrand and Floride.

*Boston's ancestors. †Derby and St. Leger winners.

On the Union Course, New York, the fastest four-mile heats were as follows:

Fashion, 5 years, 111 lbs., and Boston, 9 years, 126 lbs., 7.32 1-2—7.45.

Tally-ho, 4 years, 104 lbs., and Bostona, 5 years, 111 lbs., 7.33—7.43.

Fashion, aged, 123 lbs., and Peytona, 5 years, 117 lbs., 7.39—7.45.

Eclipse, 9 years, 126 lbs., and Henry, 4 years, 108 lbs., 7.37 1-2—7.49.

Red-Eye, 8 years, 126 lbs., and One-Eyed Joe, 6 years, 117 lbs., 7.52—7.39.

Lady Clifden, 4 years, 101 lbs., and Picton, 3 years, 90 lbs., Picton winning first heat, 7.44—7.43 1-2—7.56 1-2.

Principles of Breeding.

In relation to the principles and practice of breeding for the turf and for general purposes, Stonehenge on British Rural Sports, than whom none could be more competent to advise, and although written from an English stand-point is applicable to any country or conditions The author, in an essay holds the following:

THE PRINCIPLES AND PRACTICE OF BREEDING FOR THE TURF AND FOR GENERAL PURPOSES.

Before proceeding to enlarge upon the practical management of the breeding stud, it will be well to ascertain what are the known laws of generation in the higher animals.

The union of the sexes is, in all the higher animals, necessary for reproduction; the male and female each taking their respective share.

The office of the male is to secrete the semen in the testes, and emit it into the uterus of the female, where it comes in contact with the ovum of the female—which remains sterile without it.

The female forms the ovum in the ovary, and at regular times, varying in different animals, this descends into the uterus for the purpose of fructification, on receiving the stimulus and addition of the sperm-cell of the semen.

The semen consists of two portions—the *spermatozoa*, which have an automatic power of moving from place to place, by which quality it is believed that the semen is carried to the ovum; and the sperm-cells, which are intended to co-operate with the germ-cell of the ovum in forming the embryo.

The ovum consists of the germ-cell, intended to form part of the embryo,—and the yolk, which nourishes both, until the vessels of the mother take upon themselves the task; or, in oviparous animals, till hatching takes place, and external food is to be obtained. The ovum is

carried down by the contractile power of the fallopian tubes from the ovary to the uterus, and hence it does not require automatic particles like the semen.

The embryo, or young animal, is the result of the contact of the semen with the ovum, immediately after which the sperm-cell of the former is absorbed into the germ-cell of the latter. Upon this a tendency to increase or "grow" is established, and supported at first, by the nutriment contained in the yolk of the ovum, until the embryo has attached itself to the walls of the uterus, from which it afterwards absorbs its nourishment by the intervention of the placenta.

As the male and female each furnish their quota to the formation of the embryo, it is reasonable to expect that each shall be represented in it, which is found to be the case in nature; but as the food of the embryo entirely depends upon the mother, it may be expected that the health of the offspring and its constitutional powers will be more in accordance with her state than with that of the father; yet since the sire furnishes one-half of the original germ, it is not surprising that in externals and general character there is retained a *fac-simile*, to a certain extent of him.

The ovum of mammalia differs from that of birds chiefly in the greater size of the yolk of the latter, because in them this body is intended to support the growth of the embryo from the time of the full formation of the egg until the period of hatching. On the other hand, in mammalia the placenta conveys nourishment from the internal surface of the uterus to the embryo during the whole time which elapses between the entrance of the ovum into the uterus and its birth. This period embraces nearly the whole of the interval between conception and birth, and is called utero-gestation.

In all the mammalia there is a periodical "heat," marked by certain discharges in the female, and sometimes by other remarkable symptoms in the male. In the former it is accompanied in all healthy subjects by the descent of an ovum or ova into the uterus; and in both there is a strong desire for sexual intercourse, which never takes place at other times in them.

The semen retains its fructifying power for some days, if it be contained within the walls of the uterus or vagina, but soon ceases to be fruitful if kept in any other vessel. Hence, although the latter part of the time of heat is the best for the union of the sexes, because then the ovum is ready for the contact with the semen, yet if the semen reaches the uterus first, it will still cause a fruitful impregnation, because it remains there uninjured until the descent of the ovum.

The influence of the male upon the embryo is partly dependent upon the fact that he furnishes a portion of its substance in the shape of the

sperm-cell, but also in great measure upon the effect exerted upon the nervous system of the mother by him. Hence the preponderance of one or other of the parents will, in great measure, depend upon the greater or less strength of nervous system in each. No general law is known by which this can be measured, nor is anything known of the laws which regulate the temperament, bodily or mental power, color or conformation of the resulting offspring.

Acquired qualities are transmitted, whether they belong to the sire or dam, and also both bodily and mental. As bad qualities are quite as easily transmitted as good ones, if not more so, it is necessary to take care that in selecting a male to improve the stock he be free from bad points, as well as furnished with good ones. It is known by experience that the good or bad points of the progenitors of the sire or dam are almost as likely to appear again in the offspring, as those of the immediate parents in whom they are dormant. Hence, in breeding the rule is, that like produces like, or *the likeness of some ancestor.*

The purer or less mixed the breed, the more likely it is to be transmitted unaltered to the offspring. Hence, whichever parent is of the purest blood will be generally more represented in the offspring; but as the male is usually more carefully selected, and of purer blood than the female, it generally follows that he exerts more influence than she does; the reverse being the case when she is of more unmixed blood than the sire.

Breeding "in-and-in" is injurious to mankind, and has always been forbidden by the Divine law, as well as by most human lawgivers. On the other hand, it prevails extensively in a state of nature with all gregarious animals, among whom the strongest male retains his daughters and granddaughters until deprived of his harem by younger and stronger rivals. Hence, in those of our domestic animals which are naturally gregarious, it is reasonable to conclude that breeding "in-and-in" is not prejudicial, because it is in conformity with their natural instincts, if not carried farther by art, than nature teaches by her example. Now, in nature we find about two consecutive crosses of the same blood is the usual extent to which it is carried, as the life of the animal is the limit; and it is a remarkable fact that in practice a conclusion has been arrived at, which exactly coincides with these natural laws. "Once in and once out," is the rule for breeding given by Mr. Smith in his work on the breeding for the turf; but twice in will be found to be more in accordance with the practice of our most successful breeders.

The influence of the first impregnation seems to extend to the subsequent ones; this has been proved by several experiments, and is especially marked in the equine genus. In the series of examples preserved

in the Museum of the College of Surgeons, the markings of the male quagga, when united with the ordinary mare, are continued clearly for three generations beyond the one in which the quagga was the actual sire; and they are so clear as to leave the question settled without a doubt.

When some of the elements, of which an individual sire is composed are in accordance with others making up those of the dam, they coalesce in such a kindred way as to make what is called "a hit." On the other hand, when they are too incongruous, an animal is the result wholly unfitted for the task he is intended to perform.

IN-AND-IN BREEDING.

By a careful examination of the pedigrees of our most remarkable horses, it will be seen that in all cases there is some in-breeding; and in the greater part of the most successful a very considerable infusion of it. It is difficult to say what is not to be considered such, or when to make it commence, for in all cases there is more or less relationship between the sire and dam of every thoroughbred horse; at least, I cannot find a single exception—and again, for instance, examining the pedigree of Harkaway, which is the result of one of the most direct crosses in the Stud-book, we find that his sire and dam are both descended from Eclipse and Herod through three or four strains on each side, as will be seen by referring to page 215. The same will apply to Alarm, who also is the result of as direct a cross as is often seen; and, in fact, whatever pedigree is analyzed, the result will be that the bulk of it in the fifth or sixth remove is made up of Eclipse, Herod, and Matchem, or Regulus blood. It is not that a horse goes back to one of these stallions in one line only, but through six or seven, and sometimes through nearly all his progenitors. Hence, it may be fairly assumed that all the horses of the present day are related, either closely or distantly; but when we speak of in-and-in breeding, we mean a nearer relationship than this, such as a first cousin, or, at the most, one in the second or third degree. But I believe it will be found that even this amount of relationship is desirable, if not carried too far, and that a vast number of our best modern horses have been bred in this way.

OUT-CROSSING.

By crossing the blood, we understand the selection of a sire composed of wholly different blood from that of the dam, or as different as can be obtained of such quality as is suitable to the particular purpose in view. Thus, in breeding race-horses it is found that continuing in the same strain beyond two stages deteriorates the constitutional health, diminishes the bone, and lowers the height; hence, it is important to avoid this evil, and another strain must be selected which shall lead to

the same results as were previously in existence, without the above deterioration; and this is called out-crossing, or more commonly, crossing. The great difficulty is to obtain this object without destroying that harmony of proportions, and due subordination of one part to another which is necessary for the race,horse, and without which he seldom attains high speed. Almost every individual breed has peculiar characteristics, and so long as the sire and dam are both in possession of them they will continue to reappear in the produce; but if a dam possessing them is put to a horse of different character, the result is often that the produce is not a medium between the two, but is in its anterior parts like its dam, and in its posterior resembling its sire, or *vice versa*, than which no more unfortunate result can occur. Thus, we will suppose that a very strong muscular horse is put to a very light racing mare; instead of the produce being moderately stout all over, he will often be very stout and strong behind, and very light and weak before, and as a consequence his hind-quarters will tire his fore limbs, by giving them more to do than they have the power of accomplishing. This is well seen in Crucifix, who was a very wiry and fast, but light mare, with a fore-quarter hardly capable of doing the work of her own hind-quarter. Now, she has several times been put to Touchstone—a horse remarkable for getting bad-shouldered stock, but with strong muscular propellers—and, with the solitary exception of Surplice, these have been a series of failures. Surplice was also defective in the same way, but still he managed to get along in an awkward style, but somehow or other at a great pace. Cowl, on the other hand, was a better galloper, because there was a greater harmony of parts; but he was somewhat deficient in the stout qualities which Touchstone was intended to supply; yet he will prove, I fancy, a better stallion than Surplice, because he is more truly made, and by consequence more likely to perpetuate his own likeness.

COMPARISON OF IN-BRED AND CROSSED STALLIONS.

The following list of thirty of the most immediately successful stallions of late years shows the proportion of in-bred to crossed horses of this class to be equal. I have omitted such as only became celebrated through their daughters as brood-mares, for instance, Defence, etc.

IN-BRED STALLIONS.

1. Priam. 2. Bay Middleton. 3. Melbourne. 4. Cotherstone. 5. Pyrrhus I. 6. The Baron. 7. Orlando. 8. Ithuriel. 9. Cowl. 10. The Saddler. 11. Sweetmeat. 12. Chatham. 13. Flying Dutchman. 14. Sir Tatton Sykes. 15. Chanticleer.

CROSSED STALLIONS.

1. Partisan. 2. Emilius. 3. Touchstone. 4. Birdcatcher. 5. Sir Hercules. 6. Voltaire. 7. Plenipotentiary. 8. Pantaloon. 9. Lanercost. 10. Venison. 11. Alarm. 12. Ion. 13. Harkaway. 14. Velocipede. 15. Hetman Platoff.

SELECTION OF BROOD MARE.

In choosing the brood mare, four things must be considered—first, her blood; secondly, her frame; thirdly, her state of health; and fourthly, her temper.

Her blood or breeding will mainly depend upon the views of the breeder—that is to say, what particular class of colts he wishes to obtain, and according to his decision he will look out for mares of the particular kind he desires to reproduce, on the principle that "like begets like," but subject to the various considerations partly alluded to in the last chapter, and partly in this and subsequent ones.

In frame, the mare should be so formed as to be capable of carrying and well nourishing her offspring; that is, she should be what is called "roomy." There is a formation of the hips which is particularly unfit for breeding purposes, and yet which is sometimes carefully selected, because it is considered elegant; this is the level and straight hip, in which the tail is set on very high, and the end of the haunch-bone is nearly on a level with the projection of the hip-bone. The opposite form is represented in the skeleton given with the article "Horse," which is that of a thoroughbred mare, well formed for this breeding purpose, but in other respects rather too slight. By examining her pelvis, it will be seen that the haunch-bone forms a considerable angle with the sacrum, and that, as a consequence, there is plenty of room, not only for carrying the foal, but for allowing it to pass into the world. Both of these points are important, the former evidently so, and the latter no less so on consideration, because if the foal is injured in the birth, either of necessity, or from ignorance or carelessness, it will often fail to recover its powers, and will remain permanently injured. The pelvis, then, should be wide and deep—that is to say, it should be large and roomy; and there should also be a little more than the average length from the hip to the shoulder, so as to give plenty of bed for the foal; as well as a good depth of back-ribs, which are necessary in order to support this increased length. This gives the whole framework of the trunk of a larger proportion than is always desirable in the race-horse, which may be easily overtopped; and hence many good runners have failed as brood mares, whilst a great number of bad runners have been dams of good race-horses. Beyond this roomy frame, necessary as the egg shell of the foal, the mare only

requires such a shape and make as is well adapted for the particular purpose she is intended for; or if not possessing it herself, she should belong to a family having it. If one can be obtained with these requisites in her own person, so much the more likely will she be to produce race-horses; but if not all, then it is better that she should add as many as possible to the needful framework, without which her office can hardly be well carried out. But with this suitable frame, if she belongs to a family which, as a rule, possesses all the attributes of a race-horse, she may be relied on with some degree of certainty, even though she herself should fail in some of them. Thus, there are many fine roomy mares which have been useless as race-horses from being deficient in the power of some one quarter, either behind or before, or perhaps a little too slack in the loin for their length. Such animals, if of good running families, should not be despised; and many such have stood their owners in good stead. On the other hand, some good-looking animals have never thrown good stock, because they were only exceptional cases, and their families were of bad running blood on all or most sides. No mare could look much more unlike producing *strong* stock than Pocahontas, but being of a family which numbers Selim, Bacchante, Tramp, Web, Orville, Eleanor, and Marmion among its eight members in the third remove, it can scarcely occasion suprprise that she should respond to the call of the Baron by producing a Stockwell and a Rataplan.

In health, the brood mare should be as near perfection as the artificial state of this animal will allow; at all events, it is the most important point of all, and in every case the mare should be very carefully examined, with a view to discover what deviations from a natural state have been entailed upon her by her own labors, and what she has inherited from her ancestors. Independently of the consequence of accidents, all deviations from a state of health in the mare may be considered as more or less transmitted to her, because in a thoroughly sound constitution, no ordinary treatment such as training consists of will produce disease, and it is only hereditary predispositions which, under this process, entails its appearance. Still there are positive, comparative, and superlative degrees of objectionable diseases incidental to the brood mare, which should be accepted or refused accordingly. All accidental defect, such as broken knees, dislocated hips, or even "breaks down," may be passed over: the latter, however, only when the stock from which the mare is descended are famous for standing their work without this frailty of sinew and ligament. Spavins, ring-bones, large splints, side-bones, and, in fact, all bony enlargements, are constitutional defects, and will be almost sure to be perpetuated, more or less, according to the degree in which

they exist in the particular case. Curby hocks are also hereditary, and should be avoided; though many a one much bent at the junction of the *os calcis* with the *astragalus* is not at all liable to curbs. It is the defective condition of the ligaments there, not the angular junction, which leads to curbs; and the breeder should carefully investigate the individual case before accepting or rejecting a mare with suspicious hocks. Bad feet, whether from contraction or from too flat and thin a sole, should also be avoided; but when they have obviously arisen from bad shoeing, the defect may be passed over.

Such are the chief varieties of unsoundness in the legs which require circumspection; the good points which, on the other hand, are to be looked for, are those considered desirable in all horses that are subjected to the shocks of the gallop. Calf knees are generally bad in the race horse, and are very apt to be transmitted, whilst the opposite form is also perpetuated, but is not nearly so disadvantageous. Such are the general considerations bearing upon soundness of limb.

That of the wind is no less important. Broken-winded mares seldom breed, and they are therefore out of the question, if for no other reason; but no one would risk the recurrence of this disease, even if he could get such a mare stinted. Roaring is a much-vexed question, which is by no means theoretically settled among our chief veterinary authorities, nor practically by our breeders. Every year, however, it becomes more frequent and important, and the risk of reproduction is too great for any person wilfully to run by breeding from a roarer. As far as I can learn, it appears to be much more hereditary on the side of the mare than on that of the horse; and not even the offer of a Virago should tempt me to use her as a brood mare. There are so many different conditions which produce what is called "roaring," that it is difficult to form any opinion which shall apply to all cases. In some instances, where it has arisen from neglected strangles, or from a simple inflammation of the larynx, the result of cold, it will probably never reappear; but when the genuine ideopathic roaring has made its appearance, apparently depending upon a disease of the nerves of the larynx, it is ten to one that the produce will suffer in the same way.

Blindness, again, may or may not be hereditary; but in all cases it should be viewed with suspicion as great as that due to roaring. Simple cataract without inflammation undoubtedly runs in families; and when a horse or mare has both eyes suffering from this disease, without any other derangement of the eye, I should eschew them carefully. When blindness is the result of violent inflammation brought on by bad management or by influenza, or any other similar cause, the eye itself is more or less

disorganized; and though this itself is objectionable, as showing a weakness of the organ, it is not so bad as the regular cataract.

Such are the chief absolute defects, or deviations from health in the mare; to which may be added a general delicacy of constitution, which can only be guessed from the amount of flesh which she carries while suckling or on poor "keep," or from her appearance on examination by an experienced hand, using his eyes as well. The firm, full muscle, the bright and lively eye, the healthy-looking coat at all seasons, rough though it may be in winter, proclaim the hardiness of constitution which is wanted, but which often coexists with infirm legs and feet. Indeed, sometimes the very best-topped animals have the worst legs and feet, chiefly owing to the extra weight they and their ancestors also have had to carry. Crib-biting is sometimes a habit acquired from idleness, as also is wind-sucking; but if not caused by indigestion, it often leads to it, and is very commonly caught by the offspring. It is true that it may be prevented by a strap; but it is not a desirable accomplishment in the mare, though of less importance than those to which I have already alluded, if not accompanied by absolute loss of health, as indicated by emaciation, or the state of the skin.

Lastly, the temper is of the utmost importance, by which must be understood not that gentleness at grass which may lead the breeder's family to pet the mare, but such a temper as will serve for the purposes of her rider, and will answer to the stimulus of the voice, whip or spur. A craven or a rogue is not to be thought of as the "mother of a family;" and if a mare belongs to a breed which is remarkable for refusing to answer the call of the rider, she should be consigned to any task rather than the stud-farm. Neither should a mare be used for this purpose which had been too irritable to train, unless she happened to be an exceptional case; but if of an irritable family, she would be worse even than a roarer, or a blind one. These are defects which are apparent in the colt or filly, but the irritability which interferes with training often leads to the expenditure of large sums on the faith of private trials, which are lost from the failure in public, owing to this defect of nervous system.

CHOICE OF STALLION.

Like the brood mare, the stallion requires several essentials—commencing also like her, first, with his blood; secondly, his individual shape; thirdly, his health; and, fourthly, his temper. But there is this difficulty in selecting the stallion, that he must not only be suitable *per se*, but he must also be adapted to the particular mare which he is to "serve." Thus, it will be manifest that the task is more difficult than the fixing upon a brood mare, because (leaving out of considerations all other

points but blood) in the one case, a mare only has to be chosen which is of good blood for racing purposes, while in the other there must be the same attention paid to this particular, and also to the stallion's suitability to the mare, or to "hit" with her blood. Hence, all the various theories connected with generation must be investigated, in order to do justice to the subject; and the breeder must make up his mind whether in-and-in-breeding, as a rule, is desirable or otherwise; and if so, whether it is adapted to the particular case he is considering. Most men make up their minds one way or the other on this subject, and act accordingly, in which decision much depends upon the prevailing fashion. The rock upon which most men split is a bigoted favoritism for some particular horse; thus, one man puts all his mares to Orlando; another, to Surplice or the Flying Dutchman; although they may every one be different in blood and form to the others. Now, this cannot possibly be right if there is any principle whatever in breeding; and however good a horse may be, he cannot be suited to all mares. Some, again, will say that any horse will do, and that all is a lottery; but I think I shall be able to show that there is some science required to enable the breeder to draw many prizes. That the system generally followed of late is a bad one, I am satisfied, and with constant crossing and re-crossing it is almost a lottery; but upon proper principles, and with careful management, I am tempted to believe that there would be fewer blanks than at present. I have already given my own theoretical views upon the case, illustrated by numerous examples on both sides of the question. It will now be my object to apply these views practically by selecting particular instances.

In choosing the particular blood which will suit any given mare, my impression always would be, that it is desirable to fix upon the best strain in her pedigree, if not already twice bred in-and-in, and then to put to her the best stallion available of that blood. In some cases, of course, it will happen that the second best strain will answer better, because there happens to be a better horse of that blood to be had than of the superior strain, which would otherwise be preferred. If, on the other hand, the mare has already been in-bred to the extent of two degrees, then a cross will be advisable; but I am much inclined to believe, from the success of certain well-known cases, that even then a cross into blood already existing in the mare, but not recently in-bred nor used more than once, will sometimes answer. Upon these principles I should, therefore, look for success. It is surprising to me that this very common occurrence of in-breeding among our best modern horses has so generally escaped observation, and the only way in which I can explain it is by supposing, that having frequently been through the grandam on either

side it has been lost sight of, because the knowledge of the sire's and grandsire's blood is generally the extent to which the inquiry goes. Thus, we find the most recent writer on the subject, who assumes the name of "Craven," asserting, at page 121 of "The Horse"—"There is no proximity of relationship in the genealogy of the Flying Dutchman, Touchstone, Melbourne, Epirus, Alarm, Bay Middleton, Hero, Orlando, Irish Birdcatcher, Cossack, Harkaway, Tearaway, Lothario, or others of celebrity." Now, of these the Flying Dutchman is the produce of second cousins; Bay Middleton, his sire, being also in-bred to Williamson's Ditto and Walton, own brothers; and Orlando, containing in his pedigree Selim twice over, and Castrel, his brother, in addition. Melbourne also is the produce of third cousins, both his sire and dam being descended from Highflyer. But if to these four, which he has specially named, be added the numerous "others of celebrity" to which I have drawn attention, besides a host of lesser stars too numerous to mention, it will be admitted that he assumes for granted the exact opposite of what is really the case.

The choice of particular stallions, as dependent upon their formation, is not less difficult than that of the mare, and it must be guided by nearly the same principles, except that there is no occasion for any framework especially calculated for nourishing and containing the fœtus, as in her case. As far as possible, the horse should be the counterpart of what is desired in the produce, though sometimes it may be necessary to select an animal of a breed slightly exaggerating the peculiarity which is sought for, especially when that is not connected with the preponderance of fore or hind-quarters. Thus, if the mare is very leggy, a more than usually short-legged horse may be selected, or if her neck is too short or too long, an animal with this organ particularly long, or the reverse as the case may be, should be sought out. But in all cases it is dangerous to attempt too sudden alteration with regard to size, as the effort will generally end in a colt without a due proportion of parts, and therefore more or less awkward and unwieldly.

In constitution and general health, the same remarks exactly apply to the horse as the mare. All hereditary diseases are to be avoided as far as possible, though few horses are to be met with entirely free from all kinds of unsoundness, some the effects of severe training, and others resulting from actual disease, occurring from other causes. With regard to fatness, there is an extraordinary desire for horses absolutely loaded with fat, just as there formerly was for overfed oxen at Christmas. It is quite true that the presence of a moderate quantity of fat is a sign of a good constitution, but, like all other good qualities, it may be carried to excess, so as to produce disease; and just as there often is hypertro-

phy, or excess of nourishment of the heart, or any bony parts, so is there often a like superabundance of fat causing obstruction to the due performance of the animal functions, and often ending in premature death. This is in great measure owing to want of exercise, but also to over-stimulating food; and the breeder who wishes his horse to last, and also to get good stock, should take especial care that he has enough of the one and not too much of the other.

In temper, also, there is no more to be added to what I have said relating to the mare, except that there are more bad-tempered stallions to be met with than mares, independently of their running, and this is caused by the constant state of unnatural excitement in which they are kept. This kind of vice is, however, not of so much importance, as it does not affect the running of the stock, and solely interferes with their stable management.

BEST AGE TO BREED FROM.

It is commonly supposed that one or other of the parents should be of mature age, and that if both are very young, or very old, the produce will be decrepit or weakly. A great many of our best horses have been out of old mares, or by old horses—as, for instance, Priam out of Cressida, at twenty; Crucifix, out of Octaviana, at twenty-two; and Lottery and Brutandorf, out of Mandane, at twenty and twenty-one; Voltaire got Voltigeur at twenty-one; Bay Middleton was the sire of Andover at eighteen, and Touchstone got Newminster at seventeen. On the other hand, many young stallions and mares have succeeded well, and in numberless instances the first foal of a mare has been the best she ever produced. In the olden times, Mark Antony and Conductor were the first foals of their dams; and more recently, Shuttle Pope, Filho da Puta, Sultan, Pericles, Oiseau, Doctor Syntax, Manfred and Pantaloon, have all been first-born. Still these are exceptions, and the great bulk of superior horses are produced later in the series. The youngest dam which I ever heard of was Monstrosity, foaled in 1838, who produced Ugly Buck at three years old, having been put to Venison when only two years of age. Her dam, also, was only one year older when she was foaled; and Venison himself was quite a young stallion, being only seven years old when he got Ugly Buck; so that, altogether, the last mentioned horse was a remarkable instance of successful breeding from young parents. As in most cases of the kind, however, his early promises were not carried out, and he showed far better as a two-year-old, and early in the following year, than in his maturity. Such is often the case, and, I believe, is a very general rule in breeding all animals, whether horses, dogs, or cattle. The general practice in breeding is to use young stal-

lions with old mares, and to put young mares to old stallions; and such appears to be the best plan, judging from theory as well as practice.

BEST TIME FOR BREEDING.

For all racing purposes, an early foal is important, because the age takes date from the 1st of January. The mare, therefore, should be put to the horse in February, so as to foal as soon after January 1st as possible. As, however, many mares foal a little before the end of the eleventh month, it is not safe to send her to the horse before the middle of the second month in the year. For further particulars, see "Thoughts on Breeding," and the "Stud-Farm," in which the general management of the mare and foal is fully detailed.

It will be interesting that the reader have a pretty complete record of the best time at various distances in racing. Such a record has been carefully compiled for *Turf, Field and Farm* up to the close of the season of 1879; and which we append:

Fastest and Best Time, and Most Creditable Performances on Record, at all Distances, to end of Year 1879.

HALF A MILE.

Olitipa, by imp. Leamington, Saratoga, July 25, 1874, 0:47 3-4.
Pomeroy, by Planet, Louisville, Ky., May 23, 1877, 0:49 1-4.
Harold, by imp. Leamington, Saratoga, July 23, 1878, 0:49 1-4.
Idalia, by imp. Glenelg, Jerome Park, June 8, 1876, 0:49 1-2.
Leona, by War Dance, Lexington, Ky., May 12, 1874, 0:49 1-2.
Blue Lodge, by Fellowcraft, Lexington, Ky., May 10, 1879, 0:49 1-2.
Duke of Magenta, by Lexington, Saratoga, July 24, 1877, 0:49 1-2.
Idalia, by imp. Glenelg, Long Branch, July 4, 1876, 0:49 3-4.
Sensation, by imp. Leamington, Saratoga, July 22, 1879, 0:49:3-4.
Kimball, by imp. Buckden, Louisville, Ky., May 21, 1879, 0:49 3-4.
Observanda, by Tom Bowling, Louisville, Ky., May 21, 1879, 0:49 3-4.
Grenada, by King Alfonso, Long Branch, July 5, 1879, 0:49 3-4.

FIVE-EIGHTHS OF A MILE.

Bonnie Wood, by imp. Bonnie Scotland, Saratoga, July 20, 1878, 1:02 3-4.
Grenada, by King Alfonso, Saratoga, Aug. 10, 1879, 1:03 1-2.
Harold, by imp. Leamington, Long Branch, July 4, 1878, 1:03 1-2.
Rachel, by imp. Bonnie Scotland, Long Branch, July 6, 1878, 1:03 1-2.
Palmetto, by Narragansett, Saratoga, Aug. 10, 1876, 1:03 1-2.
Rhadamanthus, by imp. Leamington, Saratoga, July 25, 1876, 1:03 1-2.
Egypt (aged), by Planet, Saratoga, July 19, 1879, 1:04.

Aristides, by imp. Leamington, Jerome Park, Oct. 7, 1874, 1:04 1-2.
Volturno, by imp. Billet, Saratoga, Aug. 21, 1878, 1:04 3-4.

THREE-QUARTERS OF A MILE.

First Chance, by Baywood, Philadelphia, Pa., Oct. 17, 1876, 1:15.
Lady Middleton, by imp. Hurrah, Saratoga, Aug. 1, 1879, 1:17, 1:15 1-4. First was dead heat with Checkmate.
Bill Bruce, by Enquirer, Lexington, Ky., May 12, 1876, 1:15 1-2.
Connor, by Norfolk, Carson, Nev., Oct. 19, 1879, 1:15 1-2.
Rhadamanthus, by imp. Leamington, Saratoga, Aug. 19, 1877, 1:15 1-2.
Florence B., by Tom Bowling, Louisville, Ky., Sept. 20, 1879, 1:15 3-4.
Madge, by imp. Australian, Saratoga, Aug. 21, 1874, 1:15 3-4.
Alarm, by imp. Eclipse, Saratoga, July 15, 1872, 1:16.
Belle of the Meade, by imp. Bonnie Scotland, Nashville, Tenn., Oct. 9, 1876, 1:16.
Enquiress, by Enquirer, Detroit, July 5, 1879. 1:16.
Egypt (aged), by Planet, Louisville, Ky., May 26, 1877. 1:17.
Milan, by Melbourne, Jr., Louisville, Ky., May 26, 1877, 1:16.
Girofle, by imp. Leamington, Prospect Park, Sept. 13, 1879, 1:16 1-4.
Spendthrift, by Australian, Nashville, Oct. 8, 1878, 1.16 1-2.
Checkmate, by imp. Glen Athol, Saratoga, Aug. 15, 1879, 1:16 1-4.
Kimball, by imp. Buckden, St. Louis, June 13, 1879, 1:16 1-2.
Mistake, by Waverly, Louisville, Ky., Sept. 23, 1879, 1:16 1-2.
Madge, by imp. Australian, Saratoga, N. Y., Aug. 15, 1876, 1:16 1-2.
Glendalia, by imp. Glenelg, Louisville, Ky., Sept. 24, 1879, 1:16 1-2.
Pigne, by imp. Leamington, Saratoga, Aug. 27, 1877, 1:16 3-4.
Tom Bowling, by Lexington, Long Branch, 1872, 1:16 3-4.
Bowling Green, by Tom Bowling, Louisville, Sept. 24, 1879, 1:16 3-4.
Duke of Magenta, by Denington, Saratoga, Aug. 16, 1877, 1:16 3-4.
Spartan, by Lexington, Saratoga, Aug. 16, 1877, 1:16 3-4.
Sly Dance, by War Dance, Louisville, Sept. 22, 1879, 1:16 3-4.
Bye and Bye, by imp. Bonnie Scotland, Louisville, Sept. 22, 1879, 1:16 3-4.
McWhirter, by Enquirer, Louisville, Ky., May 15, 1879, 1:17.
Wallenstein, by Waverly, Lexington, Ky., May 15, 1879, 1:17.
Countess, by Kentucky, Saratoga, 1873, 1:17 1-2.
Beatrice, by Kentucky, Long Branch, 1:17 1-2.
Luke Blackburn, by imp. Bonnie Scotland, Prospect Park, Sept. 6, 1879, 1:17 1-2.
Oden, by Vauxhall, Saratoga, Aug. 7, 1879, 1:17 3-4.
Idalia, by imp. Glenelg, Saratoga, Aug. 5, 1878, 1:18.

Spartan, by Lexington, Saratoga, Aug. 22, 1877, 1:19.

ONE MILE.

Ten Broeck, by imp. Phaeton, Louisville, Ky., May 24, 1877, 1:39 3-4.

Leander (Searcher), by Enquirer, Lexington, Ky., May 13, 1875, 1:41 3-4.

Redman, by War Dance, Lexington, Ky., May 13, 1876, 1:42 1-4.

Danger, by Alarm, Baltimore, May 23, 1878, 1:42 1-2.

Mahlstick, by Lever, Lexington, Ky., Sept. 20, 1877, 1:42 1-2. Chas. Gorham, by Blarneystone, Lexington, Ky., Sep. 20, 1877, 1:42 1-2. Dead heat.

Grey Planet, by Planet, Saratoga, Aug. 13, 1874, 1:42 1-2.

Dan K., by imp. Bonnie Scotland, Louisville, Ky., May 29, 1877, 1:42 1-2.

Goodnight, by Enquirer, Louisville, Ky., Sep. 23, 1879, 1:42 1-2

Katie Pease, by Planet, Buffalo, N. Y., Sep. 8, 1874, 1:42 3-4.

Alarm, by imp. Eclipse, Saratoga, July 17, 1872, 1:42 3-4.

Glenmore, by imp. Glen Athol, Detroit, July 4, 1879, 1:42 3-4.

Virginus, by Virgil, Saratoga, Aug. 4, 1877, 1:42 3-4.

Cammie T., by imp. Glenelg, Louisville, Sept. 20, 1879, 1:43.

Mistake, by Waverly, Louisville, Sept. 26, 1879, 1:43 1-2.

Edinburg, by Longfellow, Lexington, May 11, 1878, 1:43 1-2.

Belle of the Meade, by imp. Bonnie Scotland, Louisville, Sept. 25, 1876, 1:44 1-2.

Belle of the Meade, by imp. Bonnie Scotland, Louisville, Sept. 27, 1876, 1:44 1-4.

Spendthrift, by imp. Australian, Nashville, Oct. 12, 1878, 1:44 1-4.

Clara D., by imp. Glenelg, Sacramento, Sept. 27, 1877, 1:44 1-2.

Astral, by Asteroid, Lexington, Ky., Sept. 12, 1873, 1:44 3-4.

Parole, by imp. Leamington, Saratoga, Aug. 10, 1875, 1:44 3-4.

Aristides, by imp. Leamington, Baltimore, Oct. 22, 1874, 1:44 3-4.

Susquehanna, by imp. Leamington, Saratoga, Aug. 8, 1876, 1:45.

Charley Howard, by Lexington, Saratoga, Aug. 17, 1876, 1:45.

Firework, by Lexington, Baltimore, Oct., 1874, 1:45.

Hamburg, by Lexington, Cincinnati, 1869, 1:45.

Battle Axe, by Monday, Saratoga, 1873, 1:45 1-2.

Spendthrift, (aged) by imp. Bonnie Scotland, Jerome Park, June 6, 1876, 1:46 1-2.

Tom Bowling, by Lexington, Long Branch, Aug. 8, 1872, 1:47.

MILE HEATS.

Kadi, by Lexington, Hartford, Conn, Sept. 2, 1875, fastest second

heat, and fastest two heats ever run, 1:42 1-2, 1:41 1-4.

L'Argentine, by War Dance, Louisville, Ky., Sept. 27, 1879. Beatitude won first heat, 1:42 1-4, 1:42 1-2, 1:45 1-2.

Mark D., by Monday, Sacramento, Sept. 19, 1878, 1:43, 1:42 3-4.

Himyar, by Alarm, St. Louis, June 4, 1878, 1:42 1-2, 1:43 1-2.

Camargo, by Jack Malone, Louisville, Ky., May 20, 1875, 1:42 3-4, 1:43 1-4.

Una, by War Dance, Prospect Park, June 25, 1879, 1:42 1-4, 1:45.

Tom Bowling, by Lexington, ran mile heats at Lexington, Ky., May, 1873, in 1:43 1-2, 1:43 1-2.

Thornhill, by Woodburn, ran first two heats in 1:43, 1:43; Thad Stevens (aged), by Langford, won the third, fourth and fifth in 1:43 1-2, 1:46 1-2, 1:45.

Clara D., by imp. Glenelg, San Francisco, Sept. 13, 1878, 1:43, 1:43 1-2.

Brademante, by War Dance, Saratoga, Aug. 9, 1877, 1:43 1-2, 1:43 1-2.

Bramble, by imp, Bonnie Scotland, Nashville, Oct. 7, 1878, 1:43, 1:44.

Lena Dunbar, by Leinster, Sacramento, Sept. 17, 1878, 1:44 1-4, 1:42 3-4.

Springbok, by imp. Australian, Utica, N. Y., June 25, 1874, 1:45, 1:42 3-4.

ONE MILE AND ONE-EIGHTH.

Bob Woolley, by imp. Leamington, Lexington, Ky., Sept. 6, 1875, 1:54.

Janet Murray, by Panic, Brighton Beach, July 13, 1879, 1:54 3-4.

Blue Eyes, by Enquirer, Louisville, Ky., May 28, 1879, 1:55 1-4.

Warfield, by War Dance, Louisville, Ky., Oct. 1, 1878, 1:56.

Jack Hardy, by imp. Phaeton, St. Louis, June 4, 1878, 1:56.

Fadladeen, (aged) by War Dance, Saratoga, Aug. 19, 1874, 1:56.

Picolo, Concord, Saratoga, Aug. 15, 1874, 1:56.

Himyar, by Alarm, Louisville, Sept. 20, 1879, 1:56.

Jils Johnson, by Longfellow, Lexington, Sept. 11, 1879, 1:56 1-2.

Fannie Ludlow, by imp. Eclipse, Saratoga, Aug. 10, 1879, 1:56 1-2.

Round Dance, by War Dance, Louisville, Sept. 27, 1879, 1:56 1-2.

Konrad, by Rebel Morgan, New Orleans, April 26, 1878, 1:56 1-2.

Ben Hill, by imp. Bonnie Scotland, Louisville, Sept. 25, 1879, dead heat, 1:56 3-4.

Mollie McGinley, by imp. Glen Athol, Brighton Beach, Sept. 10, 1879, 1:57.

Una, by War Dance, Prospect Park, Sept. 11, 1879, 1:57.

Susquehanna, by imp. Leamington, Saratoga, July 24, 1877, 1:57 1-4.

Experience Oaks, by Lexington, Saratoga, Aug. 20, 1872, 1:57 1-4.

Bramble, by imp. Bonnie Scotland, Saratoga, Aug. 17, 1878, 1:58.
Bramble, " " " " " " 9, 1879, 1:58.
Kennesaw, by imp. Glengarry, Louisville, May 28, 1878, 1:58 1-2.
Essillah, by Lever, Nashville, Apr. 29, 1879, 1:58 1-2.
Gabriel, by Alarm, Brighton Beach, Sept. 27 1879, 1:59.
Edinburg, by Longfellow, Louisville, Sept. 25, 1878, 1:59.
Diamond, by imp. Leamington, Ogdensburg, N. Y., Sept. 10, 1878, 1:59.
Lancewood, by imp. Leamington, Saratoga, Aug. 13, 1879, 1:59.
Belle, by Dickens, Saratoga, July 23, 1878, 1:59.
Rhadamanthus, by imp. Leamington, Saratoga, Aug. 15, 1876, 1:59 3-4.
Spendthrift (aged), by imp. Bonnie Scotland, Jerome Park, June 10, 1876, 2:00
Phyllis, by imp. Phæton, Louisville, Sept. 27, 1876, 2:01.
Spendthrift, (aged), by imp. Bonnie Scotland, Jerome Park, June 12, 1875, 2:03 1-4

ONE MILE AND A QUARTER.

Charley Gorham, by Blarneystone, Lexington, May 18, 1877, 2:8 1-2.
Falsetto, by Enquirer, Lexington, May 10, 1879, 2:08 3-4.
Grimstead, by Gilroy, Saratoga, July 24, 1875, 2:08 3-4.
Frogtown, by imp. Bonnie Scotland, Lexington, Ky., May 1872, 2:09 1-2.
Monitor, by imp. Glenelg, Prospect Park, Sept. 9, 1879, 2:10.
Parole, by imp. Leamington, Saratoga, July 20, 1878, 2:10 1-2.
Mate, by imp. Australian, Jerome Park, Oct. 3, 1874, 2:11 3-4.
Preakness, by Lexington, Jerome Park, June 13, 1874, 2:12.

ONE MILE AND THREE-EIGHTHS.

Spendthrift, by imp. Australian, Jerome Park, June 10, 1879, 2:25 3-4.
Gov. Hampton, by Planet, Prospect Park, June 21, 1879, 2:26 1-2.
Bramble, by imp. Bonnie Scotland, Long Branch, July 10, 1879, 2:27.

ONE AND A HALF MILES.

Tom Bowling,* by Lexington, May 12, 1874, 2:34 3-4.
Parole, by imp. Leamington, Saratoga, Aug. 14, 1877, 2:36 3-4.
Lord Murphy, by Pat Maloy, Louisville, May 20, 1879, 2:37.
Day Star, by Star Davis, Louisville, May 21, 1878, 2:37 1-2.
Aristides, by imp. Leamington, Louisville, Ky., May 7, 1875, 2:37 3-4.
Glenelg, by Citadel, Long Branch, Aug. 2, 1870, 2:37 3-4.
Shylock, by Lexington, Jerome Park, Oct. 31, 1874, 2:38.
Baden Baden, by imp. Australian, Louisville, May 22, 1877, 2:38.

Vagrant, by Virgil, Louisville, May 14, 1877, 2:38 1-4.
Peru, by imp. Glengarry, Lexington, Ky., Sept. 11, 1879, 2:38 3-4.
Belle of Nelson, by Hunter's Lexington, Louisville, May 23, 1878, 2:39.
Imp. Saxon, by Beadsman, Belmont stakes, Jerome Park, June 13, 1874, 2:39 1-2.
Tom Ochiltree, by Lexington, Jerome Park, Oct. 14, 1877, 2:43.
Zoo Zoo, by imp. Australian, Saratoga, Aug. 21, 1877, 2:43 1-4.
Duke of Magenta, by Lexington, Jerome Park, June 8, 1878, 2:43 1-2.
*Tom Bowling was permitted to extend the run to two miles. He ran the first mile in 1:41 3-4; mile and a half in 2:34 3-4; one and three-quarters miles in 3:00 3-4; and two miles in 3:27 3-4. The last two unofficial.

ONE MILE AND FIVE-EIGHTHS.

Ten Broek, by imp, Phaeton, Lexington, Ky., Sept. 9, 1875, 2:49 1.4.
Monitor, by imp. Glenelg, Prospect Park, Sept. 13, 1879, 2:50 1-2.
Springbok, by imp. Australian, Jerome Park, June 20, 1874, 2:53.
Brademante, by War Dance, Lexington, May 17, 1877, 2:53 3-4.
Harry Bassett, by Lexington, Belmonte stakes, Jerome Park, June 10, 1871, 2:56.
Mintzer, by imp. Glenelg, Saratoga, July 23, 1879, 2:58.
Katie Pease, by Plant, Ladies' stake, Jerome Park, June 11, 1873, 2:58 1-4.

ONE AND THREE-QUARTER MILES.

One Dime, by Wanderer, Lexington, Sept. 12, 1879, 3:05 1-4.
Irish King, by Longfellow, Sept. 25, 1879, 3:05 1-4.
Courier, by Star Davis, Louisville, May 23, 1877, 3:05 1-4.
Reform, by imp. Leamington, Saratoga, Aug. 20, 1874, 3:05 3-4.
Mate, by imp. Australian, Long Branch, July 15, 1875, 3:06 1-4.
D'Artagnan, by Lightning, Saratoga, July 24, 1875, 3:06 1-2.
Gen. Phillips, by imp. Glenelg, Saratoga, Aug. 5, 1879, 3:06 1-2.
Emma C., by Planet, Louisville, Ky., Sept. 23, 1875, 3:06 3-4.
Frogtown, by imp. Bonnie Scotland, Lexington, Ky., May 26, 1872, 3:07.
Danicheff, by Glenelg, Saratoga, Aug. 9, 1879, 3:07.
Gov. Hampton, by Planet, Prospect Park, Sept. 9, 1879, 3:07 1-2.
Kenny, by Curles, Prospect Park, June 25, 1879, 3:07 1-2.
Leveler, by Lever, Lexington, Sept. 9, 1878, 3:07 1-2.
Neecy Hale, by Lexington, Lexington, Ky., Sept. 14, 1876, 3:07 3-4.
Catesby, by imp. Eclipse, Saratoga, Aug. 15, 1874, 3:07 3-4.
Parole, by imp. Leamington, Saratoga, Aug. 11, 1877, 3:08.
Kennesaw, by imp. Glengarry, St. Louis, June 5, 1878, 3:08.

Duke of Magenta, by Lexington, Saratoga, July 20, 1878, 3:08.

Joe Daniels, by imp. Australian, Travers' Stake, Saratoga, July 15, 1872, 3:08 1-4.

Preakness, by Lexington, Baltimore, Oct. 21, 1864, 3:08 1-2.

Viceroy, by Gilroy, Saratoga, Aug. 9, 1877, 3:08 1-2.

Volturno, by imp. Billet, Brighton Beach, Sept. 16, 1879, 3:08 1-2.

Atilla, by imp. Australian, Travers's Stake, Saratoga, July 25, 1874, 3:09 1-2, 3:08 3-4. The first was a dead heat with Acrobat.

Mintzer, by imp. Glenelg, Saratoga, July 28, 1879, 3:09 1-4.

Falsetto, by Enquirer, Saratoga, July 19, 1879, 3:09 1-4.

Zoo Zoo, by imp. Australian, Saratoga, Aug. 2, 1877, 3:10.

TWO MILES.

Ten Broeck, by imp. Phæton, against time, Louisville, May 29, 1877, 3:27 1-2.

McWhirter, by Enquirer, Louisville, May 28, 1877, 3:30 1-2.

Courier, by Star Davis, Louisville, May 28, 1877, 3:31 3-4.

Katie Pease,* by Planet, Buffalo, Sept. 9, 1874, 3:32 1-2.

True Blue, by Lexington, Saratoga, July 30, 1873, 3:32 1-2.

Jack Frost, by Jack Malone, Cleveland, O., July 31, 1874, 3:33 1-2.

Glenmore, by imp. Glen Athol, Detroit, July 5, 1879, 3:33 1-2.

Lizzie Lucas, by imp. Australian, Saratoga, Aug. 21, 1874, 3:33 3-4.

Creedmoor, by Asteroid, Louisville, Ky., Sept. 20, 1876, 3:34.

Geo. Graham, by Rogers; first heat; Louisville, Ky., Sept. 25. 1875, 3:34.

Lord Murphy, by Pat Malloy, Louisville, Sept. 22, 1879, 3:34.

King Alfonso, by imp. Phæton, Louisville, Ky., Sept. 20, 1875, 3:34 1-2.

Hegira, by imp. Ambassador, New Orleans, La., Nov. 23, 1850, 3:34 1-2.

Littleton, by imp. Leamington, Lexington, Ky., May 23, 1871, 3:34 1-2.

Monitor, by imp. Glenelg, Baltimore, Oct. 21, 1879, 3:34 3-4.

Wilful, by imp. Australian, Prospect Park, June 24, 1879, 3:34 3-4.

Charlie Howard, by Lexington, Saratoga, Aug. 10, 1876, 3:35.

Vandalite, by Vandal, Breckinridge Stake, Baltimore, Oct. 23, 1874, 3:35.

Himyar, by Alarm, Louisville, Sept. 25, 1879, 3:35.

Falsetto, by Enquirer, Saratoga, Aug. 14, 1879, 3:35 1-4.

Volturno, by imp. Billet, Baltimore, Oct. 25, 1879, 3:35 1-4.

Vandalite, by Vandal, Dixie Stake, Baltimore, Oct. 20, 1874, 3:35 1-2.

Harry Basset, by Lexington, Saratoga, Aug. 16, 1871, 3:35 1-4.

Vigil, by Virgil, Baltimore, Oct. 28, 1876, 3:37 1-4.

*Katie Pease came in first, but was disqualified, and race given to Lizzie Lucas.

TWO MILE HEATS.

*Brademante, by War Dance, Jackson, Miss., Nov. 17, 1877 (?) 3:32 1-4, 3:29.?,

Willie D., by Revolver, Prospect Park, Sept. 11, 1879, 3:34 1-2, 3:35.

Lottery, by Monday, Sacramento, Cal, Sept. 21, 1878, 3:36, 3:35 1-2.

Arizona, by Lexington, Louisville, Ky., May 18, 1875, 3:37 1-4, 3:35 1-2.

Aureola, by War Dance, Lexington, Sept. 18, 1872, 3:37 3-4, 3:35 1-2.

London, by Lightning, Nashville, Oct. 5, 1872, 3:36 3-4, 3:37 1-4.

Bushwhacker, by imp. Bonnie Scotland, Baltimore, Oct. 22, 1878, 3:36, 3:36 1-2, 3:38 1-2.

Princeton won second heat by head. Bushwhacker second; best average three heats.

Belle of Nelson, by Hunter's Lexington, Cincinnati, June 1, 1878, 3:37 1-4, 3:36 1-4.

Mollie Jones, by Roxbury, Galesburg, Ill., July 4, 1874; Rocket won first heat, 3:36, 3:40, 3:37 1-4.

Eolus, by imp. Leamington, Baltimore, May 28, 1874; the fastest third heat, 3:40, 3:39 1-4, 3:36 3-4.

Lancaster, by Lexington, Lexington, Ky., Sept. 12, 1867, 3:35 1-4, 3:38 1-4.

Jack Sheppard, by Jack Malone, Nashville, Oct. 12, 1876, 3:35 3-4, 3:42 1-2.

Irish King, by Longfellow, Baltimore, Oct. 21, 1879, 3:37 3-4, 3:37 3-4.

Harkaway, by Enquirer, St. Louis, June 7, 1878, 3:39, 3:35 1-4.

*Brademante's time very doubtful.

TWO MILES AND ONE-EIGHTH.

Aristides, by imp. Leamington, Lexington, Ky., May 10, 1876, 3:45 1-2.

Mate, by imp. Australian, Saratoga, July 31, 1875, 3:46 3-4.

Monmouth, by War Dance, Louisville, May 19, 1875, 3:48 1-4.

Big Fellow, by War Dance, May 15, 1874, 3:50.

Dave Moore, by Longfellow, Lexington, May 16, 1879, 3:50 1-2.

Ferida, by imp. Glenelg, Prospect Park, Sept. 5, 1879, 3:54.

Springbok, by imp. Australian, Saratoga, Aug. 3, 1874, 3:56.

Sultana, by Lexington, Jerome Park, Oct. 7, 1876, 3:56 3-4.

TWO MILES AND A QUARTER.

Preakness, by Lexington; Springbok, by imp. Australian, dead heat, 3:56 1-4.

Harry Bassett, by Lexington, Saratoga, July 16, 1872, 3:59.

Wanderer, by Lexington, Saratoga, Aug. 13, 1874, 4:00 1-2.

Kentucky, by Lexington, Saratoga, Aug., 1865, 4:01 1-2.

Fortuna, by Enquirer, Louisville, May 23, 1879, 4:01 1-2.

Bramble, by imp. Bonnie Scotland, Baltimore, May 24, 1879, 4:02.
Mollie McCarty, by Monday or Eclipse, Chicago, June 25, 1879, 4:02.
Muggins, by Jack Malone, Saratoga, Aug., 1867, 4:03.

TWO AND A HALF MILES.

Aristides, by imp. Leamington, Lexington, Ky., May 13, 1876, 4:27 1-2.
Katie Pease, by Planet, Buffalo, Sept. 10, 1874, 4:28 1-2.
Ballankeel, by Asteroid, Baltimore, Oct. 22, 1874, 4:31 3-4.
Helmbold, by imp. Australian, Long Branch, July 30, 4:32 1-2.
Tom Ochiltree, by Lexington, Jerome Park, June 18, 1877, 4:36 1-2.
Edinburgh, by Longfellow, Cincinnati, June 7, 1879, 4:36 1-2.

TWO MILES AND FIVE-EIGHTHS.

Ten Broeck, by imp. Phaeton, Lexington, Ky., 1876, 4:58 1-2.

TWO MILES AND THREE-QUARTERS.

Hubbard, by Planet, Saratoga, 1873, 4:58 3-4.
Kentucky, by Lexington, Jerome Park, Oct. 3, 1866, 5:04.
Tom Ochiltree, by Lexington, Jerome Park, June 17, 1876, 5:09 1-4.

THREE MILES.

Ten Broeck, by imp. Phæton, Louisville, Ky., Sept. 23, 1876, 5:26 1-2.
Monarchist, by Lexington, at Jerome Park, 1872; first mile, 1:45; 5.34 1-2.
Tom Ochiltree, by Lexington, Long Branch, July 6, 1876, 5:35 3-4.

THREE MILE HEATS.

Brown Dick, by imp. Margrave, New Orleans, April 10, 1865; the best second heat on record, and second best three mile heat race, 5:30 3-4; 5:28.

Mollie Jackson, by Vandal, Louisville, Ky., May 25, 1861; Sherrod won the second heat. The last two miles of the first heat were run in 3:35; the last two of the second heat in 3:36 3-4: the ninth mile in 1:48 1-4. This is the best three heats and the best third heat on record, 5:35 1-2; 5:34 3-4; 5:28 3-4.

Norfolk, by Lexington, Sacramento, Cal., Sept. 23, 1875; best average two heats, 5:27 1-2; 5:29 1-2.

Vandal, by imp. Glencoe, Lexington, May 26, 1855, 5:36 1-2; 5:33.
Whisper by Planet, St. Louis, June, 8, 1878, 5:39; 5:35 1-2.

FOUR MILES.

Ten Broeck, by imp. Phæton, vs. Fellowcraft's time, Louisville, Ky., Sept. 7, 1876, 7:14 3-4.

Fellowcraft, by imp. Australian, Saratoga, Aug. 20, 1874, 7:19 1-2.

Lexington, by Boston, vs. time, New Orleans, La., April 2, 1855, 7 :17 3-4.

Lexington, by Boston, beating Lecomte, New Orleans, April 14, 1855, 7 :23 3-4.

Janet, by Lightning, Louisville, Sept. 27, 1879, 7 :29.

Wildidle, by imp. Australian, San Francisco, Oct. 28, 1875, 7 :25 1-2.

Idlewild, by Lexington, over Centreville Course, L. I., June 25, 1863, 7 :26 1-4.

Thad. Stevens, by Langford, best second heat, California, Oct. 18, 1873, 7 :30.

Kentucky, by Lexington, Saratoga, 1866, 7 :31 1-2.

Silent Friend, by imp. Australian, New Orleans, April 21, 1873, 7 :30 1-2.

Kentucky, by Lexington, vs. time at Jerome Park, 1867; first two miles, 3 :36; first three 5 :29; 7 :31 3-4.

Abd-el-Kader, by Australian, Saratoga, 1869, 7 :31 3-4.

Abd-el-Koree, by imp. Australian, Jerome Park, Fall 1871; best time for a three-year-old, 7 :33.

Monarchist, by Lexington, Jerome Park, 1872; first two miles, 3 :39 3-4; first three, 5 :36; 7 :33 1-2.

Tom Ochiltree, by Lexington, Jerome Park, Oct. 12, 1876, 7 :36.

FOUR MILE HEATS.

Lecompte, by Boston, at New Orleans, April 8, 1854, beating Lexington and Reube, 7 :26, 7 :38 1-4.

Rupee, by Voucher, April 10, 1858, 7 :39, 7 :35.

Miss Foot, by imp. Consol, at New Orleans, March 26, 1842, 8 :02, 7 :35.

Fashion, by imp. Trustee, over Union Course, L. I., May 10, 1842, beating Boston match, 7 :32 1-2, 7 :45.

Morgan Scout, by John Morgan, at Lexington, Ky., 1870, best race ever run in Kentucky, 7 :32 1-2, 7 :43 1-2.

George Martin, by Garrison Zinganzee, beating Hannah Harris and Reel, March 29, 1843. Reel broke down in first heat, 7 :33, 7 :43.

Bushwhacker, by imp. Bonnie Scotland, Baltimore, Oct. 26, 1878. Princeton won second heat, 7 :31, 7 :36 1-4, 8 :29.

Glenmore, by imp. Glen Athol, Baltimore, two and three heats, best third heat, 7 :29 1-2, 7 :30 1-4 7 :31.

Tally-ho, by Boston, at Union Course, L. I., Oct. 8, 1849; Free Trade won the first heat, Boston the third, and Tally-ho second and fourth, 7 :33 1-2, 7 :43 1-2, 7 :52, 8 :10 1-2.

HURDLE RACES.

Joe Rodes, by Virgil, mile heats, over four hurdles, St. Louis, June 4, 1878, 1 :50 3-4, 1 :50 1-4.

Judith, by imp. Glenelg, mile heats, over four hurdles, Prospect Park, Sept. 11, 1879, 1:52, 1:52.

Lobelia, by imp. Bonnie Scotland, mile heats, over four hurdles, Fashion Course, L. I., Sept. 11, 1869, 1:51 3-4, 1:53 1-4.

Waller, by imp. Hurrah, one and a quarter miles, over five hurdles, Saratoga, Aug. 14, 1878, 2:21 1-2.

Disturbance, by Chillicothe, one and a quarter miles, over 5 hurdles, Saratoga, Aug. 22, 1878, 2:21 3-4.

Problem, by Pimlico, one and a half miles over 6 hurdles, Long Branch, July 5, 1879, 2:50.

Derby, by Eugene, one and a half miles, over six hurdles, Long Branch, July 2, 1878, 2:52.

Judith, by imp. Glenelg, one and three-quarter miles, over seven hurdles, Long Branch, Aug. 28, 1879, 3:36 1-2.

Tom Leathers, by Camps Whale, two miles, over eight hurdles, New Orleans, April 16, 1875, 3:47 1-2.

Redman, by War Dance, two miles, over eight hurdles, Louisville, Ky., May 19, 1876, 3:48 1-2.

Captain Hutchinson, by Voucher, two miles, over eight hurdles, Columbus, O., July 3, 1875, 3:50.

Jonesboro, by Lexington, two miles, over eight hurdles, welter weights; New Orleans, April 11, 1868, 3:51 1-2.

Milesian, by imp. Mickey Free, two miles, over eight hurdles, welter weights; Long Branch, Aug. 3, 1872, 3:52 1-2.

Cariboo, by Lexington, two and a quarter miles, over nine hurdles, Long Branch, 1875, 4:33.

STEEPLE CHASES.

Dead Head, by Julius, about two and three-quarter miles, thirty-six leaps, Saratoga, Aug. 26, 1878, 5:33 1-2

Trouble, by Ulverston, about two and three-quarter miles, thirty-six leaps, Saratoga, Aug. 19, 1876, 5:34 3-4.

Duffey, by Hunter's Lexington, about two and three-quarter miles, thirty-six leaps, Saratoga, Aug. 5, 1873, 5:48 3-4.

FASTEST TROTTING TO WAGON.

One mile, Judge Fullerton, San Francisco, Nov., 1874, time 2:20 1-2.

Two miles, Gen. Butler and Dexter, each a heat, Long Island, 1863, time 4:56 1-4.

Three miles, Kemble Jackson, June, 1853, time 8:03.

Four miles, Longfellow, Dec. 31, 1869, time 10:34 1-2.

Five miles, Little Mack, Long Island, Oct. 29, 1863, time 13:43 1-2.

Twenty miles, John Stewart, Long Island, Sept. 22, 1868, time 59:23.

TRAINING TO TROTTING.

The idea of the average horse owner is that training means pampering the horse. Nothing could be further from the mark. It truly means the very best and most intelligent care, feeding and exercise for the work to to be performed, and this exercise must be in proportion to the distance.

The artificial care given the horse in confinement renders blankets necessary for all fast working horses. Doubly so for turf horses, whose pace is of the most exhausting kind. To get rid of superfluous flesh sweating and exercise is necessary. The superfluous flesh and undue moisture of the body having been properly reduced, then the pace of the horse should correspond to that expected in the final trial. That is for mile heats a faster pace will be required than for longer heats, but the horse must be carefully worked up to the point, the improvement being carefully and intelligently watched, that as the day of trial approaches he may have a real trial of speed for the distance to be trotted. There is, however, no rule that can be laid down as to the amount of work to be done before this trial takes place. It will depend upon his condition while at work and the manner in which he accomplishes his brushes, as spurts of speed are called for short distances. These are among the most important parts of training, since they tend not only to extend the stride of the horse and improvement in speed. but the manner of coming out of them will indicate the condition of the animal.

High-strung, eager, generous horses must be handled in a very different manner from sterner tempered ones. In any case, the horse must come to place implicit confidence in his driver. The first must be restrained; the second urged. The first named seldom have the power to accomplish all they would. The second must be made to know that it is speed and distance that is required, and that they must go the pace if it is in them.

Feeding is essentially important. Some horses crave much hay. Such must be restrained; some gluttons will eat their bedding. If so, they must be muzzled when not feeding, and always so at night. If a horse is so light a feeder that he will not eat twelve quarts of oats a day, he may have a little Indian corn, but this only in exceptional cases. Sound, heavy oats, thoroughly cleaned and sifted, should constitute the feed of the trotting horse, or any horse of fast work. The light feeder must be carefully watched in his work. Some horses will eat fourteen to sixteen quarts of oats a day. Such should have corresponding exercise; for in no event must fat be allowed to accumulate. We should prefer to limit any horse, however large and powerful, to fourteen quarts of oats per

day, or rather to that number of pounds. As a rule twelve quarts or pounds should suffice for the average horse.

Hiram Woodruff, than whom there is no better authority, in his work on "The Trotting Horse of America," in relation to the preparation which precedes the first trial, says:

During the preparation which precedes the first trial, it will be necessary to give the horse one or two sweats. Whether it ought to be one or two must be indicated by the condition and nature of the animal, the races in which he is engaged, and resolved by the judgment of the trainer. The amount of clothes in which he shall be sweated must be determined by the same considerations. Some may require a blanket and hood, and a wrapper round the neck to start the perspiration out of them; while there are others that will sweat freely with but little clothes, and scrape well when more have been thrown on at the end of the jog. One thing may certainly be said, that a sweat obtained without the use of heavy clothing is more satisfactory and better than one with it, provided the latter method does not include a good deal more work to get the sweat. Only a moderate quantity of clothing and little work while the horse is going are the best for a sweat, if a good scrape can thus be obtained. When the horse comes from the drive, and is taken out of the wagon, he will soon be ready to scrape. That done, he must be blanketed up again, and walked about out of the draft. A favorable day for the sweat ought to be taken advantage of, as a matter of course. Another light scrape may probably be had after some little time spent in walking in the blankets; but, if the perspiration does not continue so as to give this second scrape, it is not to be forced by more work in the clothes. To be of use in itself, and as a satisfactory indication that the condition of the horse is advanced it must come of itself. During the time this scraping process is in course of operation, the trainer having the conduct of it should not be in a hurry. The same things that are said to cure a man's cold—patience and a little water-gruel—will often do wonders in procuring a good sweat. Commonly, however, it is easy enough to get the sweat and scrape, but more difficult to cool the horse out properly. In order to do this well, he is to be clothed again, and led very gently about for a considerable period, so that he may become cool gradually, and the perspiration may dry away by degrees. This walking is to be out of all draft as much as possible; and it will not do to hurry it over, and go to the stable, until the horse has cooled off well and gradually. When the proper state has been reached, the horse is to be taken into the stable and his body is to be well dressed. This done, he is to be re-clothed, and again led into the air.

A few sups of gruel, made of Indian meal or fine shorts, from half a

pint to a pint of the meal stirred into a bucket of water may now be given to the horse, or water with the chill taken off it may be used as a substitute for the gruel. When taken into the stable again, which will be after a little more walking about in the air, the legs are to be put in tubs of warm water, the body clothing being kept on. The legs are then to be well washed with the water and castile soap, and when dried off to be bandaged. These bandages should be of light flannel, and it is immaterial whether it is red or white. They are not to be put on tight. The legs of a horse ought never to be bandaged tight, for such a course impedes the circulation into the feet, where there is a great necessity for it; but losing sight of this, the bandages are sometimes pulled so that it looks as if they were intended to serve as a tourniquet, and stop the circulation of the blood altogether. Neither can it serve any useful purpose, that I can see, to bind the suspensory ligament up to the bone of the leg. Nature intended that in the horse it should stand out from it, as we see in the fine flat legs of the best runners and trotters. Whatever support is required may be obtained with only a moderate degree of tightness; and I have sometimes thought that an elastic stocking, such as our best surgeons use in cases of bad strain to the nerves and muscles of the human foot and ankle, would be a very useful article in a training-stable.

DRIVING.

The average farmer's boy supposes he can drive a trotting horse. Has he not seen the pictures of drivers sitting back, apparently holding to the reins with a grasp, as though the stronger the horse was pulled the faster he could go? Such driving never got speed out of a horse. The best drivers simply allow the horse to pull on the bit with sufficient force to steady himself, and this pulling force must be graduated according to circumstances. It is true many fast horses are hard pullers, and generally so from defects in training. The bit and reins are intended simply as the medium of communication between the horse and the driver, and the more intelligently the horse is trained to their use, the more will be got out of him. The horse should be taught to take a firm hold of the bit, not for the purpose of pulling upon, but that the driver may give the horse needed support and steadiness, and that intelligent action may be established between the driver and the horse.

The object of keeping the horse well in command during fast work, on the road as well as on the track, is that he may instantly respond to the wish of the driver through the medium of the reins. Thus he may be pressed from day to day in his speed, until he at last comes to the full measure of his powers.

Although trotting speed does not come to the horse until some years

after he is fully developed in growth, the history of trotting shows that this increase of speed continues to develop until the horse is from ten to twelve years old. Hence there should be no hurry to develop the animal while young. He should be driven from the time he is three years old, sufficient to cause him to lengthen his stride as much as possible. He should be taught to listen quickly, never to frighten or shy at any object, and this by familiarizing him with whatever may be near. In his brushes, either on the road or the track, however sharp they may be, they should never be extended until the animal shows signs of distress. When he is being regularly trained for some public trial of speed, it will be time enough to find out if he can go the desired pace.

DRIVING ON THE ROAD.

Road driving, like driving or riding a race, is a fine art. In road driving the object is not only to get good speed out of the animal driven, but he must also be made to go in fine style. With a horse of naturally fine action, this, if the driver understands his business, is not difficult. If not a horse of naturally fine style and action, he may be spoiled. For road work the horse should have been better flexed than when he is to be used for trotting a race. He must be able to turn out quickly and handsomely in passing or meeting other teams. When being driven slowly, he must carry himself handsomely. Thus something must be sacrificed to this end.

Every horse should have a perfect fitting bit. It should be of the proper size and length for the mouth, and this can only be decided by trial. Keep trying different bits until you find one in which the horse works comfortably. Above all, in handling a young horse do not injure the mouth with a cruel or rough bit. Above all, never be so cruel as to jerk his mouth with the reins. The bit is the medium of communication between the driver and the horse. If there is any speed in the horse, it is to be gotten out of him by means of the bit, and hence the more sensitive you can keep the mouth, the more likely you are to succeed. If you render the mouth numb or callous through pulling, twitching, sawing or other smart tricks of drivers, you do so to the permanent injury of the horse. Therefore first acquire a nice touch yourself, and there will be no difficulty in imparting it to the horse.

Never lose your temper with the horse. If a horse does so that is no reason why you should. Never strike a horse with the whip for any fault, and then jerk him back with the reins. If necessary to punish him, first assure yourself that you have him sufficiently well in hand so he cannot "jump out of the harness." Have a definite object in view, for every use of rein or whip. Above all avoid a steady, rigid pull on the horse. Some horses will not trot without being pulled hard. It is

usually from defect in training. The perfect horse is trained to pull just sufficient to steady himself in harness. How Hiram Woodruff drove, he tells in his "Trotting-Horse of America." No one, during his life, or since his death, was better authority in such matters. Hence, we cannot do better than to give it to our readers in his exact words.

In order that a fast horse should be under circumstances to do his best, he should be as much at his ease in his harness and general rig as possible. If he is not, he is placed at almost as much disadvantage as if sore or stiff, or suffering from some bodily ailment. You may see horses brought out of the stable to trot with a very tight check to keep their heads up, and a tight martingale to keep them down. Such a horse is in irons; and when to this is added a dead drag at the reins, and no movement of the bit from end to end, I cannot see how he could do his best. People talk about a steady, bracing pull; but, in my opinion, that is not the right way to drive a trotter. There is a great difference between letting go of your horse's head, and keeping up one dull, deadening pull all the time. The race-horse riders practice what is called a bracing pull; and, a great many times, I have seen their horses tire under it without ever running their best. The steady pull checked them. The pull should be sufficient to feel the mouth, and give some support and assistance, so as to give the horse confidence to get up his stride. More than that is mischievous. To keep the mouth alive, the bit must be shifted a little occasionally. A mere half-turn of the waist, or less than half a turn, by which the thumb is elevated and the little finger lowered, is sufficient to shift the bit, keep the mouth sensitive, and rouse the horse.

The reins are to be held steadily with both hands while this play with the wrist is made; and it is, of course, only done with one wrist at a time. The hands should be well down; and the driver ought not to sit all of a heap, with his head forward. Neither should he lean back, with his bodily weight on the reins, which, in that case, are made a sort of stay for him. He should be upright; and what pulling he must do should be done by the muscular force of the arms. The head and the arms are what a good driver uses; but some hold their arms straight out, and pull by means of putting the dead weight of their bodies on the reins. If, instead of lying back, and putting their bodily weight on the reins, with which latter they take a turn round their hands, drivers would depend upon their muscular strength, they could let up on the pull, graduate it, and so ease the horse from time to time instantaneously. The driver who depends upon the arms has command of the horse: he who substitutes bodily weight with the reins strapped round his hands, has not half command of the horse, or of himself either; and, if the horse is a puller, he will soon take command of the driver. The reason of it is, that there

is no intermission of the exertion, no let up, either for man or horse. Besides, in that way of driving, it is impossible to give those movements to the bit which seem to refresh and stimulate the horse so much. When a horse has been taught the significance of this movement of the bit, the shift by the turn of the wrist, he will never fail to answer it, even though he should seem to be at the top of his speed. The moment he feels this little move of the bit in his sensitive mouth, he will collect himself, and make another spurt; and the value of this way of driving is, that the horse is not likely to break when thus called upon, while a high-strung, generous horse, if called upon for a final effort with a whip, is as likely to break the moment it falls on him as not. I have won many a very close heat by practising this movement, and therefore I have no hesitation in recommending it. It is not difficult to acquire, and the horse soon comes to know what it means.

Let us come now to the way of taking hold of the reins. A wrap around the hand, such as running-horse riders take, is clumsy and bad. I do not know whether many people take hold of the reins as I do, or not. Perhaps not. Sim. Hoagland is the only one who takes hold precisely as I do, so far as I have observed. When we have been jogging horses together at early morning, we have often talked over these matters; and, whether our way was the best way or not, we could never see any other that suited us half so well.

I will try to explain how I hold the reins: I could show it in two seconds. Take, first, the right-hand rein. This, coming from the bit, passes between the little finger and the third finger, over the little finger, then under the other three fingers, and up over the thumb. The left-hand rein is held in the left hand exactly in the same way; but the bight of the slack of the rein is also held between the thumb and forefinger of the left hand. This gives some substance in that hand; but, if it is found inconvenient to have it there by those who have small hands, it may be dropped altogether. A firm grasp on each rein, with the backs of the hands up, and without any wrap, is thus obtained. It is a great point in driving to be able to shift the reach—that is, the length of the hold you take—without for an instant letting go of the horse's head. With this way of holding the reins, it is easily done. If I want to shorten the hold on the left hand rein (the near one), I take hold of that rein just behind the left hand with the thumb and forefinger of the right hand, and steady it. This is very easily done; and it does not interfere at all with the command of the off rein with the right hand. The near rein being thus steadied behind the left hand, I slide that hand forward on the rein, which is kept over the little finger, under the other three fingers, and over the thumb all the time, and then shut the grasp again on the new reach.

A shift with the right hand is made just in the same way, by taking hold and steadying the rein behind that hand with the thumb and forefinger of the left hand.

"I have often observed, that, with other methods of holding the reins, there was great difficulty in shifting the reach. The driver tries to do it; but, for an instant, he has let go of the horse's head on one side altogether, and broken his stride. When this is found to be the case, the dead pull all the time is adopted; and this spoils the freedom and elasticity of the horse's stride, and chokes off his wind. I do not intend this to be taken as instruction for professional drivers. Every driver has a way of his own; and some of them have very good ways, for, as I have taken occasion to state before, they drive well. But what I have set down above may be of service to gentlemen who drive their own horses, and to those young men who, having as yet no settled method of their own, may think it well enough to try that which I have found to answer. Another word about bits. I am opposed to the use of severe bits, and complicated things of that sort. Some of the inventors of such things say I am prejudiced; but I don't think I am. If a man has a horse that cannot be driven with a bar-bit or a snaffle, he may as well sell him, except it is a very exceptional case. Where are these kinds of severe complicated bits most in use? Why, in England; five hundred or a thousand of them are used there to one that is used here: and where do the horses trot the best? These bits are mostly invented by men who have had no practical experience whatever as to what sort of driving a fast trotter requires to keep his gait square and bold, and induce him to do his best when it is called for. When a horse has a good mouth—and a bad one is almost always the fault of bad breaking and driving—the easier the bit you use, the better he will act for you, and the more speed he will show you."

Trotting Horses.

It has often been said of Northern and Eastern men, that they do not take kindly to the saddle. In a sense this is true, especially in the North. In England the passion for riding in the saddle grew up at a time when there were, so to speak, no roads. In the earlier settlement of America, throughout the then vast timber region, the same state of things existed; but a people who settle a new country have something else to think of than riding to hounds or other pleasure riding. So the country became settled; the level or gently undulating nature of the country rendered good roads passable at light cost, and the absence of preserves of game, a landed aristocracy, and the improvement in vehicles for pleasure and use, tended to force public taste in the direction of driv-

ing. Hence the early appreciation of the trotting horse, and the wonderful development in speed in this direction.

In the South, racing stock held its own, and does even to this day; and nobly have they contested the palm of victory, and successfully, on many

MOVEMENT IN TROTTING.

hard fought fields of racing blood in England and our own country. At the North, however, the trotting horse now reigns supreme. It is the intention here to present something of the wonderful increase in speed and endurance of the trotting horse of America, with information of the

most celebrated horses that early gave fashion to this style of going, and a full list of animals and performances, that the reader may see at a glance the growth of this passion for trotting horses.

EARLY TROTTERS.

Until 1823 we have but little authentic information that regular trotting courses were established, and not until 1830 were fast trotting courses established. According to *Porter's Spirit of the Times*, the first public trotting in America for a stake was a match against time for $1,000.

In 1824, A. M. Giles trotted his horse 28 miles in one hour and fifty-seven seconds. The same year Topgallant and Betsey Baker were matched to trot three miles in harness for $1,000 a side. The race was won by Topgallant by 40 yards, in 8 minutes, 42 seconds. Topgallant also trotted 12 miles on the road in 39 minutes. The "Albany pony" did a mile in 2 minutes, 40 seconds. The Treadwell mare did one mile in 2:34; and Boston Blue trotted 18 miles within the hour. Boston Blue is reported to have been the first horse that trotted a mile in three minutes; it having been done in 1818. So that it will be seen that the Treadwell mare in 1824 had reduced the time to 2:34. Yet for many years after a 2:40 horse was considered extraordinary, as also was any horse capable of going on the road in 3 minutes.

In 1827, on the Hunting Park Association of Philadelphia, Screwdriver won two heats at two miles, beating Betsey Baker in 8:02 and 8:10, the three best time on record. Dutchman afterwards accomplished the same distance in 7:32 1-2, and Lady Suffolk in 7:40 1-2.

In 1840, on the Long Island course, Jerry beat Whalebone in a three mile trotting race, in 8:23 the first heat, and 8:15 the second. The best time for 2 mile heats that year was 5:22, 5:21; for 3 miles, 8:26, 8:27, 8:41, 8:56. On long distances Sweetbrier accomplished six miles in 18:52.

In 1834 Edwin Forrest, as yet an unentered horse, trotted his mile in 2:31 1-2, beating Sally Miller. The course was 1 mile and 10 yards in length.

In 1835 Dutchman made four miles, under the saddle, in 11:19 and 10:51, and Dolly, by Messenger, out of a thoroughbred mare, five miles to wagon, carrying two men, weighing 310 pounds, in 16:45; and immediately was started again to do 10 miles more, which she accomplished in 34:07. The same year the horse Daniel D. Thompkins, under the saddle, trotted three mile heats in 7:59 and 8:10.

In 1842 Ripton beat Lady Suffolk, at 3 miles in harness, in 5:07 and 5:17.

In 1843 Lady Suffolk made mile heats in 2:28 1-2, 2:28, 2:28, 2:29

and 2:32, which was not again equaled until 1854, when this record was covered by Tacony.

In 1844 Cayuga Chief made the first half mile in a race in 1:15, the fastest yet made in public; and Fanny Jenks accomplished 100 miles, in harness, in 9 hours 38 minutes 34 seconds. The slowest mile was done in 6:25 and the fastest in 4:47. At the end of the race this mare was driven an extra mile in 4:23.

In 1849 Lady Suffolk trotted 19 times and won 12, beating Grey Eagle and Mac twice, Pelham five times, Lady Sutton twice, Trustee four times; also beat Black Hawk, Gray Trouble, Plumbay and other horses. This year a Canadian mare, Fly, is said to have been driven from Cornwall to Montreal, ninety miles, in 8 hours and 15 minutes. Fanny Jenks made 100 miles in 9 hours 38 minutes and 34 seconds. Fanny Murray trotted one hundred miles in 9 hours 41 minutes 23 seconds.

In 1852 Tacony won 12 races, beating all the best horses of the day, making a single mile in 2:26; two miles in 5:02, and was beaten only twice. As a 3 year Ethan Allen trotted this year in 3:20. Flora Temple this year won her first purse, on the regular turf, in 2:41.

In 1853 the entire sporting interest was centered in Flora Temple and Tacony. Flora this year beat all the best horses of the day, winning seventeen times. Her best time at mile heats was 2:27, 2:28, and at 2 mile heats 5:01 1-2, 4:59. This year Tacony trotted a mile in 2:25 1-2.

In 1856 the contest lay principally between Flora Tempte and Lancet. Flora made 11 races, winning nine, beating Lancet four times in harness, and Tacony three times in harness, Tacony going under the saddle. This year Flora Temple lowered the one mile record to 2:24 1-2.

That the trotting horse of America owes his great powers to the infusion of thorough blood, we have before stated. To Imported Messenger is this due in the greatest degree. Messenger's sire was Mambrino, his second sire Engineer, and his third sire Samson. Thence to Blaze, Flying Childers and the Darley Arabian. Samson is reported to have been coarse and homely, and Engineer rough and coarse, but both of these horses were of extraordinary substance.

Another great trotting sire of America was imported Bellfounder. There has been much controversy over his breeding, first and last, but that he was a staunch trotter, and a getter of admirable horses, there is no doubt, giving splendid action to his get. Still, it must be admitted that, admirable as was Bellfounder himself, his get was not equal to the descendants of Messenger in all that constitutes speed, endurance and action.

Durac also became a valuable factor in our trotting blood. His strain of blood appears in the Medley's, Durac Messenger's, Mambrino Chief's and Gold Dust's.

One of the sub-families of Messenger's blood, Hambletonian, who united the blood of Messenger and Bellfounder, has raised the trotting horse of America to the highest point of perfection. He was not a handsome horse from a thoroughbred standpoint, if indeed he was thoroughbred, which has been doubted. It has been given as follows:

Hambletonian was by Abdallah; he by Mambrina, a son of Messenger. The dam of Abdallah, the mare Amazonia. The dam of Hambletonian by imported Bellfounder; second dam by Hambletonian; third dam, Silvertail, said to have been by imported Messenger.

In all that constitutes stoutness and ability to perform, in freedom from tendency to disability, his stock has been wonderful. Noted for immense and strong joints, length and strength of bone, magnificent muscular development, prominent, square, massive build, mighty hips and excellent barrel, all knit together to form a most admirable frame, united to a nervous constitution, that reproduced itself in his descendants, in a most wonderful degree.

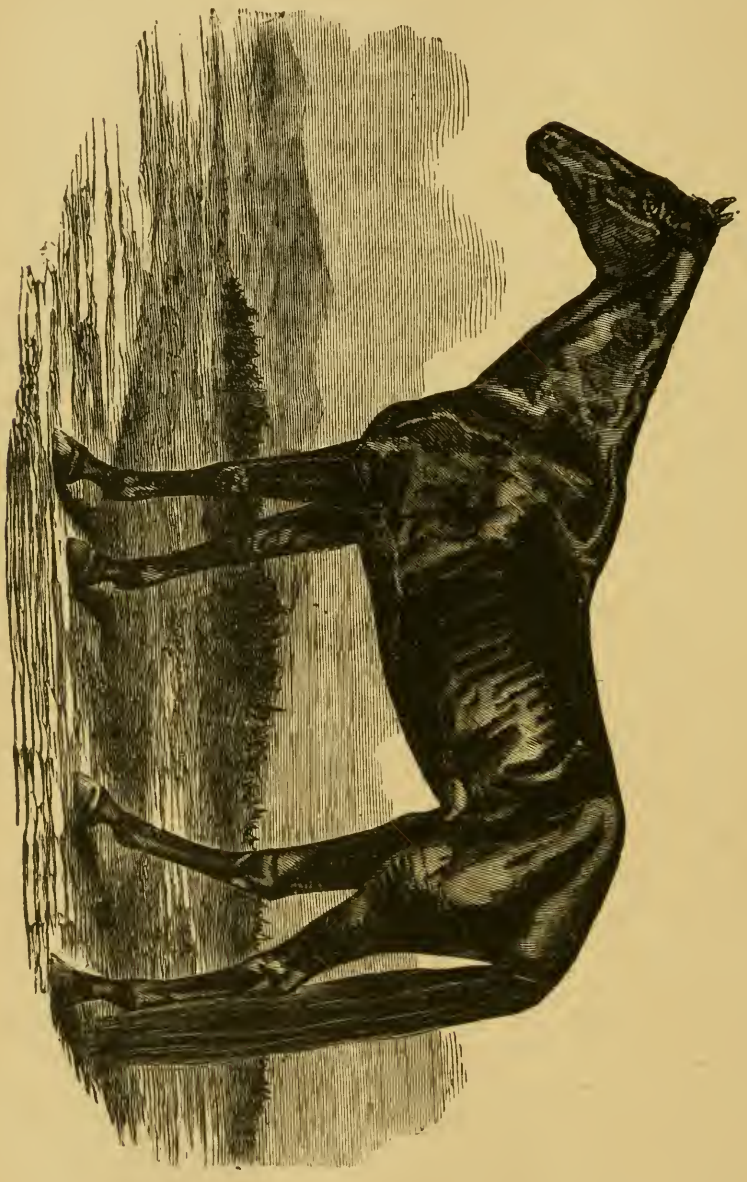
One of the finest specimens of the Hambletonian stock is shown on the preceding plate. This fine horse was by Rysdyk's Hambletonian, by Abdallah, by Mambrino, by Imp. Messenger. Dam Kitt, by Long Island Black Hawk, by Andrew Jackson, by Young Bashaw, by Imported Bashaw. Is half-brother to Dexter, time 2.17¼; Nettie, 2.18; Jay Gould, 2.21¼; Gazelle, 2.21; George Wilkes, 2.22; Volunteer (who has eight trotters below 2.25); Edsall's Hambletonian (Sire of Goldsmith Maid, 2.14); Edward Everett (Sire of Judge Fullerton, 2.18); Bruno and Brunette, that trotted double in 2.25¼. Foaled 1868; bright golden bay; two white feet; star and small stripe on face; black legs, mane and tail; 15½ hands high. A horse of fine finish, and shows his high breeding; remarkably strong and well-backed; thick through the heart; game head; beautiful, strong eyes, set wide apart; clean, sinewy limbs, and sound feet; perfectly sound, excellent constitution, good temper, and very intelligent; a natural trotter, with the big, open, fast, easy, stride of the Hambletonians.

Of Goldsmith Maid, one of the truly great descendants of this blood, Mr. H. T. Helm, of Chicago, in 1876, wrote as follows:

GOLDSMITH MAID,

"The Queen of the Trotting Turf, was foaled in 1857, and is now nineteen years old. She was bred by John D. Decker, of Sussex county, N. J. Her dam was one of those yellow-bay mares so common in the produce of old Abdallah. She was undersized, fretful, and of a nervous temperament, and up to the age of six years had performed no work of any kind, except to run occasional races about and on the farm, for the amusement of the boys. In 1863 she was sold by Mr. Decker for $260; the purchaser selling her again, on the same day, to Mr. Tompkins, for $360, and she was soon afterward bought by Mr. Alden Goldsmith, for $600. The eye of the practical horseman discovered that she was worth

the handling. He discovered her ability, and soon brought the world to a knowledge of her value. Under his careful and patient management, and the skillful drivers employed by him, she soon displayed such speed



GOLDSMITH MAID.

and extraordinary qualities of game and endurance, that he was able to sell her, at about the age of eleven years, for the sum of $20,000. The purchasers were B. Jackman and Mr. Budd Doble, and, under the guidance of the latter, she has steadily advanced in a career of fame that is

without a parallel in the history of the trotting turf. She was subsequently sold, by the two gentlemen last named, to H. N. Smith, for the sum of $37,000, and yet remains his property. She has been matched against all the great trotters of her period; and, while she has occasionally lost a race, she has ultimately vanquished all competitors, and steadily lowered the record for trotting performances, and at the age of eighteen, marked the marvelous, and thus far unapproachable, record of a mile in 2:14.

"Twice during the year 1876 she trotted in a race in 2:15, and although in her first race against the renowned Smuggler she was beaten, she by no means surrendered her queenly scepter, for again, at Buffalo, she asserted her supremacy in the three fastest successive heats on record. Proudly does she command the sympathy and applause of all beholders when she hurls at her powerful competitor the defiant challenge, "You may become King, but I am yet Queen."

"It were useless to mention the names and performances of others, there is no name that can be compared with that of the little bay mare; the fame and the radiance of all others pale before the brilliancy of a renown that followed her to the age of twenty years, and has been witnessed on every great course throughout the expanse of a continent. I subjoin a description of the Trotting Queen, from the pen of one of our most accurate and capable writers:

"Goldsmith Maid is a bay mare 15 1-4 hands, no white. She appears, at first glance, to be rather delicately made, but this conception is drawn from the form, rather than the quality of her make-up. Her head and neck are very clean and blood-like; her shoulder sloping and well placed; middle piece tolerably deep at the girth, but so light in the waist as to give her a tucked-up appearance, and one would say a lack of constitution, but for the abundant evidence to the contrary; loin and coupling good; quarters of the greyhound order—broad and sinewy; her limbs are clean, fine-boned and wiry; feet rather small, but of good quality. She is high mettled, and takes an abundance of work without flinching. In her highest trotting form, drawn to an edge, she is almost deer-like in appearance, and when scoring for a start and alive to the emergencies of the race, with her great flashing eye and dilated nostrils, she is a perfect picture of animation and living beauty. Her gait is long, bold and sweeping, and she is, in the hands of a driver acquainted with her peculiarities, a perfect piece of machinery. She seldom makes an out-and-out break, but frequently makes a skip, and has been accused of losing nothing in either case. Aside from the distinction of having trotted the fastest mile on record, she also enjoys the honor of making the fastest three consecutive heats ever won in a race, which renders any comments upon her staying qualities unnecessary.

She continued on the turf until past twenty years old, and after completing that age she closed her public career with the year 1877 by trotting during that year forty-one heats in 2:30 or better, and making a time record of 2:14 1-2. Her record stands at the close of her career at 2:14, with 332 heats in 2:30 or better. Her record and her career are "the marvel of the age." Goldsmith Maid finally found a home at the Fashion stud farm, at Trenton, N. J., there to end her days.

DEXTER.

Dexter has been so often described, that the public are familiar with his appearance. A dark bay or brown gelding, with a white stripe the full length and width of his face, and four white legs; 15 hands, 1 inch high; his head as finely cut in its outline as that of Australian or Bonnie Scotland; an eye that does not stand out with the prominence of the Abdallah eye in Hambletonian, but one that sparkles with a glance of fire that speaks of that which is back of the orb; his mane and tail are medium in fulness, and in form and blood-like appearance he is hardly surpassed by that of any thoroughbred of full age in the country. His record of 2:17 1-4 is familiar to all.

JAY GOULD.

Jay Gould is a bright bay horse, of fine mould and finish, 15 hands 2 inches in height; rather light-appearing in form, but of great and powerfully formed quarters, and a tolerably fair set of limbs. His head is a finely formed one, and he has a face that indicates the high degree of intelligence that in so great a measure marks this branch of the family. He has trotted twenty heats in 2:30 or better, and reached a record of 2:21 1-2, and in addition is credited with one son, King Philip, a young horse only five years old, that has trotted nine heats in 2:30 or better, and reached a record of 2:21.

MAUD S.

HOW SHE WAS RAISED AND WHAT SHE HAS ACCOMPLISHED.

Maud S. was foaled on the Woodburn stud farm, Kentucky, on the 28th of March, 1874. She is of Harold, dam Miss Russell by Pilot, Jr., second dam Sallie Russell by old Boston. She is 15 hands 3 inches in height, 1½ inches higher behind than in front; her weight is 965 pounds; she is a red-chestnut mare without a white spot. Until she was 4 years of age the mare was owned by Captain Stone and was formed under his personal supervision. When she was a colt she was gentle and affectionate, and a great pet with Captain Stone's daughter. Miss Stone became very much attached to her pet, and the mare seemed to be just as much attached to her. Captain Stone, therefore, requested his daughter to name her equine playfellow, and in compliance she gave it her

own name, Maud Stone, which was afterward abbreviated into Maud S., a name which has since become celebrated throughout Europe and America. When Maud S. was 4 years old, however, Captain Stone sold her to William H. Vanderbilt of New York. That gentleman sent her to a well-known Long Island stud farm to be formed. When she was 5 years old, however, he became dissatisfied with her handling, and sending for Captain Stone requested him to take entire charge of her future training. Captain Stone consented, and the mare has since that time been in his care. When being speeded the mare wears a 4-ounce toe-weight, adjusted so that it can be removed when she is jogging, as at that time her trainer never allows it to be worn.

HER PERFORMANCES.

Maud S.'s first public exhibition was given July 6th, 1880, at Cincinnati. She was entered in the 2.34 class. She won in three heats. Time, 2.23, 2.30 and 2.28.

Her next race was at Chicago on July 24th for a special purse against Trinkett. The mare won in three heats. Time, 2.19, 2.21 and 2.13½, in her second public race thus surprising the sporting world by making a record at which old turfmen held up their hands in wonder.

Maud S. next appeared at Cleveland on July 28th in the 2.19 class. She won in three heats; time—2.24, 2.18, 2.31.

At Buffalo, August 4th, was the next trot in the 2.19 class. The mare here lost the first heat to Charlie Ford in 2.17 and won the next three in 2.15¼, 2.16¾ and 2.16½.

At Rochester was her next trot, on August 12th, against time to beat all records. The first quarter was made in 32½, the half in 1.05, the three-quarters in 1.38¼, and the mile in 2.11¾.

Chicago was her next trotting place on an exhibition against time. In this the now widely celebrated little mare was successful. The first quarter was made in 33¼, the half 1.04½, the three-quarters in 1.36¾ and the mile in 2.11½.

In her next race at Chicago, September 18th, against time, Maud S. still more astonished the world. She made the first quarter in 34 seconds, the half mile in 1.04¾, the three-quarters in 1.36 and the mile in the wonderful time of 2.10¾, trotting the middle half in 1.02.

After this she went into winter quarters at Cincinnati in the height of her glory. On the 1st of January, 1881, she was taken up and gave her first exhibition at Columbus, Ohio, on June 30th, over a very slow track, against Rarus' best time over that track of 2.17½. She made the first quarter in 33 seconds, the half in 1.06¾, the three-quarters in 1.40 and the mile in 2.13¼.

At Detroit, July 4th, against St. Julien's best time over that track of 2.16¼. First quarter in 35½, the half in 1.08, the three-quarters in 1.42¾ and the mile in 2.13¾.

At Pittsburg, July 13th, first quarter 33 seconds, half mile 1.05½, three-quarters 1.37¼, and the mile in 2.10½, beating her former record.

At Chicago, July 23, three heats. The first mile, 2.21½. The second mile, first quarter, 34½, half mile in 1.06, the three-quarters in 1.38 and the mile in 2.11¼. The third mile, first quarter, in 34 seconds, the half in 1.06¼, the three-fourths in 1.37½, and the mile in 2.11. This was considered the greatest performance ever achieved by Maud S. Beside trotting the three fastest miles ever trotted by any horse, the track over which it was done was believed by the best judges to be at least three seconds slow.

Her best record up to August, 1881, was made at Rochester (August 11th), when she trotted the mile without a break in 2.10¼.

W. W. Bair is entitled to great credit for developing the wonderful speed of Maud S. She is a highly-bred mare, and wants to be humored. Her heart is won by kindness. She will not stand harsh treatment; will not prove obedient under rough usage. Both Bair and his wife made much of Maud S. They petted her and treated her to apples and lumps of sugar. The result is that she will eagerly respond to their call. When jogging on the track at Chester Park the presence of Mrs. Bair near the rail at any time would cause Maud to turn in that direction. During the winter the mare ran in a roomy box. In April she was put in front of a break-cart, and Mr. Bair drove her about the streets of Clifton and Cincinnati, and thus got her accustomed to the noise and bustle of the toiling world. He also harnessed her double, and taught her to drive on either side. She always behaved well to the pole. She does not like blinds to her bridle, but will trot with any kind of bit in her mouth. All she asks is that the driver shall not pull on the bit. She wears a 15½-ounce shoe forward and a 9-ounce shoe behind. She also carries 4-ounce toe weights.

After her brilliant career in 1881, Mr. Vanderbilt withdrew Maud S. from the track, and placed her in his own private stables in New York. Her quiet life was not satisfactory, however, to her many friends, who became so great an annoyance to her owner that in 1884 he sold her to Mr. Robert S. Bonner, who was already the owner of many fine horses. Forty thousand dollars is the reputed price paid for her. She was then put to several tests merely to beat her own record. She scored a mile in 2.09¾, at Cleveland, August 2d, 1884, and on November 11th, 1884, at Lexington, Ky., Mr. Bair drove her the mile in 2.09¼, the fastest time ever made by a horse.

PART II.

DISEASES OF THE HORSE:

THEIR CAUSES, HOW TO PREVENT, HOW TO KNOW AND HOW TO CURE.

Diseases of the Horse.

THEIR CAUSES; HOW TO KNOW, AND HOW TO CURE THEM.

CHAPTER I.

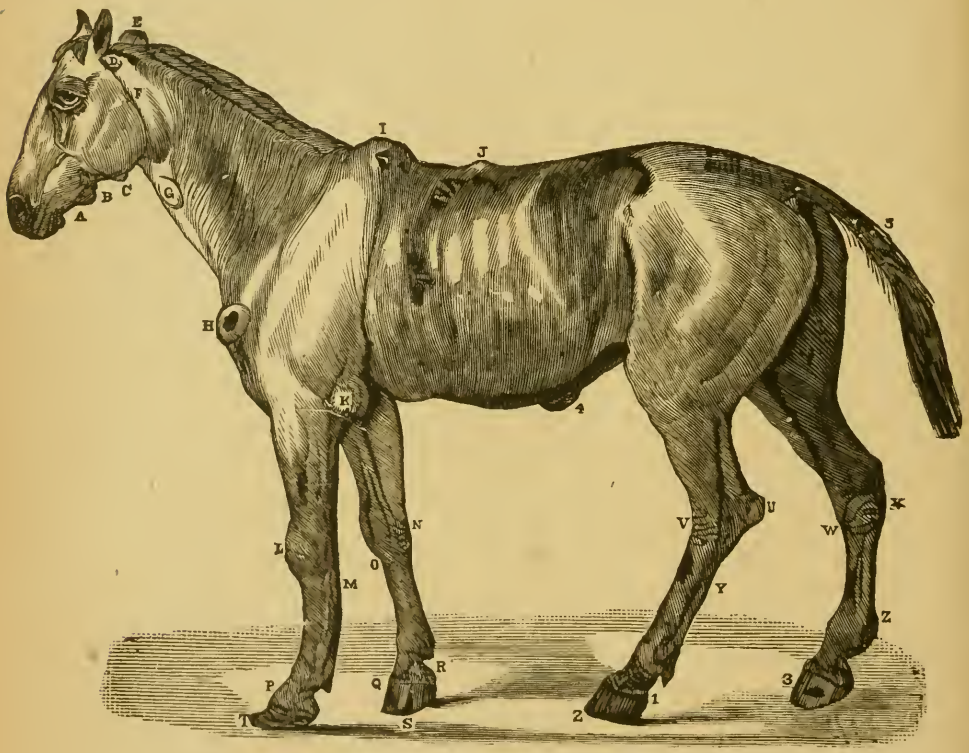
I. INTRODUCTION.—II. EXTERNAL MANIFESTATION OF DISEASE.

I. Introduction.

The various diseases to which the horse is subject, embrace nearly all those afflicting the human family, and including among them, as most common, diseases of the skin and its integuments, those of the muscles, of the ligaments, and of the bones, quite rare in the human family, and to which the horse might be completely exempt, were it not for the ignorance, and in very many cases the brutality of the master in over-driving, over-weighting, leaping, beating, neglect in clothing when heated, carelessness in grooming, want of proper ventilation in stables, and the withholding of proper and sufficient food. Take away these causes of disease and the labors of the veterinary surgeon would be light. We should see but little of caries of the bones, causing degeneration of the substance; of spavin, curb, ringbone, splint; of injuries to the sinews and tendons, causing breaking down; swellings and other of the most serious afflictions; poll evil and other fistulous diseases; of fractures; of rheumatism; founder, including grease, inflamed glands and veins, cracks of the hoofs, quittor, hernia, and all that class of diseases attacking the faithful servant of man, and henceforth rendering him useless for the purposes of pleasure or profitable labor. Instead of ending the sufferings of the tortured animal by mercifully taking its life, many owners for the sake of the few paltry dollars received, transfer the once favorite steed

to some one else equally inhuman, who thenceforth drives and goads the sufferer to labor under the most torturing circumstances, until the animal economy, entirely disorganized, perhaps by years of such unmitigated torture, drops and dies.

The object of this treatise is to so enlighten the horse owner in the nature of disease as to enable him to determine whether treatment can be made effective—if so, *what to do;* and especially is it the purpose to so acquaint him with the *causes*, that occasion for treatment may be averted. By a study of the facts we give it may be easily known whether cure is possible, and if not it is more merciful to kill and end the misery of the poor animal.



EXTERNAL MANIFESTATIONS OF SOME DISEASES OF THE HORSE.

II. External Manifestation of Disease.

For all the diseases we have mentioned but little medicine is needed. Rest and nursing are most needed—often months of rest and care, as in the case of spavin, commencing in inflammation and ending in the deposition of bony matter, stiffening of the joint, or, as in the case of exostosis of the heads of the bones, they in time become quite anchylosed,

when lameness ceases from the suspension of action of the joints caused by their complete solidification or growing together.

That the reader may form a more correct idea of what we here write, and have it brought plainly to view, we present an illustration of some of the principal diseases of the bones and tissues, caused generally by abuse, with a short description of their origin. The treatment will be given in the proper place.

A—Caries of the Jaw. Ulceration of the lower jaw, sometimes ends in mortification. Caused by bruises from barbarous bits and curb chains.

B—Fistula of the Parotid Duct. Fistulas are caused by bruises or undue compression of the parts producing inflammation and abscess.

C—Bony Excrescence. (Exostosis of the jaw). A blow upon a bone will produce inflammation followed by exostosis (bony growth through increased nutrition)—that of the joints being fearfully painful.

D—Swelling by pressure of the bridle, causing inflammation, and sometimes tumors.

E—Poll Evil. A painful fistulous disease, often difficult to cure.

F—Inflamed Parotid Gland. Caused by a bruise or compression.

G—Inflamed Jugular Vein, caused in various ways, often by carelessness after bleeding.

H—Fungus Tumor, from compression of the collar. The result of galls and subsequent want of care, and inattention.

I—Fistula of the Withers, caused generally by pressure of the saddle.

J—Saddle Gall, caused by a bad fitting saddle; sometimes ending in sitfasts.

K—Tumor of the Elbow, caused generally by interference of the shoe in lying down; sometimes by a blow. Called also, *Capped Elbow.*

L—Induration of the Knee, caused by blows in falling.

M—Clap of the Back Sinews, caused by severe exertion in running and leaping, destroying the integrity of the sinews of the leg.

N—Mallenders, scurfy manifestations at flexions of the knee, sometimes becoming cracked and itchy.

O—Splint, caused by blows, kicks, etc., on the shins. They are to be dreaded as interfering with the action of the sinews.

P—Ringbone, caused by starting heavy loads, or excessive pulling in going up hill.

Q—Tread upon the Coronet, the contusion of the shoe of one foot by treading on the other, causing laceration of the coronet and of the horn of the hoof.

R—Quittor, confined pus, from prick of the sole, corns, or injury to coronet.

S—Quarter Sand Crack. Imperfect secretion caused by dryness of the hoof; rupture of the laminæ.

T—Contracted Hoof, or ringed hoof of a foundered horse. The result of Laminatis.

U—Capped Hock. Injuring the point of the hock.

V—Sallenders. Scurfy eruptions on the seat of flexion of the hock. Similar to mallenders.

W—Spavin. Inflammation causing painful bony enlargement, sometimes stiff joint. Caused by blows, slipping and hard work, often from weak limbs.

X—Curb. Inflammation and lameness of the posterior part of the hock, ending in bony formation. Caused by wrenching or straining the limb.

Y—Swelled Sinews, caused by strains or bruises, producing inflammation, and ending in enlargement.

Z—Thick Leg, caused by various injuries to the joint. Any inflammation may result in a thickening of the integuments. In all inflammatory difficulties of this nature, including, spavin, curb, etc., cold water faithfully applied at the outset will be indicated, but often the trouble is not known until too late for cold water. The warm water fomentations will then be indicated. [See treatment].

1—Grease, caused by debility, excessive labor and neglect, filthy surroundings, from stoppage of the secretions. Scratches are from the same cause, as working in the mud without proper cleaning, etc.

2—Toe Sand Crack, caused by the same difficulty as quarter sand crack.

3—Quarter Crack. [See sand crack].

These are occasioned generally by severe labor of animals not strong in the feet, by which the walls are ruptured, by breaking the hoof with the calk of another foot. False quarter is occasioned by the absence of the outside and harder portion of the hoof.

4—Ventral Hernia. Rupture by which the bowel lies next the skin. When hernia is accompanied with strangulation it becomes dangerous.

5—Rat Tail, loss of the hair of the tail.

Fuller facts as to causes and treatment of these disorders will be found in the appropriate place in this work.

CHAPTER II.

DISEASES OF THE SKIN AND SUB-CUTANEOUS TISSUES.

I. SCRATCHES. ——II. GREASE.——III. THRUSH. —— IV. SWELLED ANKLES. —— V. SWELLED LEGS. —— VI. SURFEIT.——VII. MANGE.——VIII. RING-WORM.——IX HIDE-BOUND. —— X. SADDLE GALLS, OR SITFASTS. —— XI. FUNGOUS COLLAR TUMOR.——XII. WARTS.——XIII. VERMIN. —— XIV. LARVA IN THE SKIN.—— XV. TETTER.——XVI. RAT-TAILS.——XVII. MALLENDERS AND SALLENDERS.—— XVIII. POLL EVIL.——XIX. FISTULA.

Of skin diseases there are two classes: those resulting from neglect and general bad treatment, and those due to disorders of the internal organs with which the skin is in sympathy, or which inflame it by unnatural excretions or irritants in the blood. It is almost impossible perfectly to classify them, since even some that are generally considered to arise from constitutional causes may be produced by external circumstances, and the reverse.

In the following sections we treat the most important of both classes. Others of less moment will be found in our chapter entitled "Miscellaneous Matters and Suggestions, Minor Disorders, etc."

I. Scratches.

Causes.—These are various; as, clipping the heels, which is sometimes done, and thus destroying nature's covering, so as to allow the parts to become chilled; washing off the legs with soap and water without subsequently thoroughly drying them, and then suffering them to be exposed to cold air; standing in snow or snow-slush; standing in or upon hot and steaming manure of any kind, while in stable; or being long in mud and filth while in service and not subsequently carefully cleaned. Anything that will produce inflammation of the skin of the heel, or in any way weaken it, may produce scratches.

As is the case with other local disorders, this is most easily and rapidly

developed when the horse is not in a condition of good general health, but foul stables, while furnishing the irritating filth immediately to the seat of this disease vitiate the air also, and thus tend to bring about a two-fold trouble.

It is believed to be sometimes due to the existence on the skin of parasitic plants and insects.

The sure *preventive* is to keep the horse, if possible, in good general condition; and to confine him, when he must be confined at all, only in a dry, clean, and well-ventilated stall. When he is forced to be worked during the day in mud or slush he should be neither stabled nor turned out to pasture until both his feet and his legs are well washed and thoroughly dried.

How to know it.—Scratches are said to be unknown to European horsemen; but it is so well known in the United States as to render a description well nigh unnecessary. It appears on the back part of the foot, generally of the hind foot; and extends from the heel to the fetlock. It has been known entirely to encircle the foot, and to extend upward to the hock and to the knee. The parts are sometimes hot, swollen and sensitive before any cracking or ulceration takes place; then they become dry and scaly, and crack open by ordinary motion. A horse thus affected is apt to manifest a disposition to walk stiffly, with his hind legs, (when the disease is seated in the hind heels), wider apart than ordinary, and to throw his foot rather violently forward when an effort is made to examine it.

It is often the case that at first there are little patches of a thick, dry, scabby covering of the skin; and these spread and inflame until they form a solid mass of scab and matted hair. These scabs may be distinguished from those which sometimes appear in other skin diseases by this, that they have an unusual itchiness, which leads the horse to rub them as much as possible; and he often does this until they bleed and become raw. This disposition of the suffering creature to scratch himself is said to have originated the name by which the disease is known.

What to do.---In cases where the patient is in good condition, and the disease is in its incipient stage, a thorough cleansing of the parts with castile soap and warm water, and applying an emollient or softening poultice for a day or two, with rest, will be sufficient. If there seems to be feverishness of the system, a dose or two of Epsom salts to move the bowels, given in doses of from one to three ounces at a time, will be beneficial.

The following is for ordinary cases a most efficacious and easily used remedy:

No. 1.

½ Oz. powdered gum camphor,
1 Oz. gum myrrh,
1 Fluid oz. sulphuric acid,
1 Fluid oz. spirits of turpentine,
1 Pint of lard.

Mix thoroughly, and rub the ointment well upon the heels once a day. The legs and feet should be washed with soap suds before every application.

When the disease is chronic, and proud flesh has appeared, make a poultice of ground flax seed and lime-water; sprinkle burnt alum over the poultice, and apply. Use two or three poultices a day until the proud flesh has evidently disappeared, then use the ointment No. 1 as above directed.

Another course of treatment, to be adopted when there is a disordered condition of general health, and evidences of vitiated blood are manifested, is this:

First bleed; but observe to regulate the quantity of blood drawn by the condition of the animal as to flesh and strength. If he is poor and weak, take from the neck vein about three pints, and after nine days a like quantity. If he is plainly in poor general health, but not reduced in flesh and still strong, bleed once, taking from the neck vein three quarts. Then make careful and thorough application of ointment No. 1.

It may well be stated here that in our practice we do not often resort to bleeding, nor do we recommend it except in rare cases. To the man, however, who finds it both profitable and agreeable to be his own stock doctor it is often the quickest, easiest, and safest means of removing vitrious humors, and bringing about a more natural and healthful circulation. In some acute diseases of violent character, as pleurisy, mad staggers, and the like, it is frequently of the first importance, sometimes almost the only hope; but we would caution the reader against the indiscriminate blood-letting of the old practitioners. Observe well the symptoms; consult this department of "The Stock Doctor" carefully: and you will not fall into the mistake of taking away gallons of blood when a little rest, some good grooming, and plenty of nutritious, life-giving food, are the things mostly required. The manner of blood-letting will be found to have been treated of in our chapter entitled "Implements: what to keep and how to use."

The foregoing methods will answer in all ordinary cases; but if the patient has not been taken in hand till the disease has become chronic and obstinate, the following is a most excellent preparation and may be used instead of No. 1. It requires care in the using, as it will discolor the hands and corrode the nails if it comes in contact with them, and it should never be entrusted to bungling and inconsiderate grooms; but it

the hands of careful horsemen it is a most valuable remedy for all obstinate wounds, bruises, galls, tumors, and sores. We shall refer to it in subsequent portions of the work as *camphorated corrosive sublimate* or

No. 2. 1 Pint spirits of turpentine,
1 Oz. finely pulverized corrosive sublimate,
1 Oz. gum camphor.

Have the corrosive sublimate very finely ground in a druggist's mortar, (the efficacy of the compound depends much upon this); pulverize the gum camphor; put all together into a good strong bottle, and shake thoroughly. Then let it stand for at least twenty-four hours—longer would be better, as it becomes more and more valuable with age and repeated shakings—and it will do to use. In applying it, saturate a small mop, made of soft rags, neatly and firmly tied upon a stick. Wash before making first application of No. 2, but afterwards, unless the foot becomes very foul, this need not be done. The liniment should be applied once a day till cure is effected.

Keep the horse out of the wet during treatment, especially if the camphorated corrosive sublimate is used. See to it, also, that his stable is not only dry, but airy. If it is pasture time, he will need no other food than grass, unless it is found necessary to stable him, to keep him from rains and dews. In any event, he ought to be fed rather lightly at first, and with food not calculated to inflame. If the time is Winter give as much green, soft food as can be conveniently had, such as roots, chops, etc.

II. Grease, or Cracked Heels.

Causes.—This disease is but a modification of scratches and of thrush—partaking more of the nature of thrush, however, than of scratches, as it is confined almost exclusively to the heel, the seat of the thrush, which is seldom attacked by the scratches.

It is occasionally the result of constitutional weakness or derangement. When the system abounds in morbid matter, its tendency is towards the heels, and debility is felt in the distended vessels remote from the vital organs, ending in inflammation of the skin of the heels, distension of the sebaceous glands, a stinking deposit on the surface, and a purulent discharge through cracks.

Cutting away the hair of the fetlock, and thus exposing to sudden and protracted cold the parts which it is designed to protect, often causes this affection, even in animals of otherwise good condition.

Frequently, however, it may be regarded as most probably a secondary disease, originating in some other, which has resulted from careless or inhuman treatment, or from constitutional weakness.

It is not contagious; but filth and want of attention will produce it in nearly all horses similarly subjected to their influences.

How to know it.—It manifests nearly the very same symptoms as thrush, as given in the following section; but there is one striking peculiarity which distinguishes it from thrush, foot-evil, and other disorders of that kind—*the heel cracks open*. In a healthy state, the heel of the horse is moistened, and so kept from becoming dry and hard, by a constant secretion and discharge of an oily fluid from the cellular tissues under the skin. When this is obstructed, the skin becomes dry and feverish, and looks scurfy and hot. It soon thereafter cracks, and the pent-up oily secretion, now turned to a foul, yellowish water, flows out. As the flow of matter increases, it becomes more and more thick, stickey, and stinking; and if not attended to, the heel and sides of the foot become a mass of ulcerated excrescenses.

It sometimes manifests itself by the oozing out of a thin matter through the pores of the skin from some deep-seated disease of either the coffin-bone or the navicular joint — most frequently the latter. The more effective treatment in this case would of course be that directed to the healing of the primary disorder.

First Stage of Confirmed Grease Exudation.

What to do.—The treatment necessary is similar to that for scratches. In the first place, see to it that the causes which have induced it shall no longer operate. If the disease is secondary, it must be somewhat difficult to manage; and the animal should be allowed to rest, taking only such exercise as nature prompts, in an open pasture, except in bad weather. When it is necessary to confine him, give him a good stable, dry litter, and pure air. Remember that rest is one of the first conditions of success; while constant driving or any other labor will most probably defeat the ends of the physician.

Second Stage of Confirmed Grease Cracks.

If the disease is discovered in its early stage, and the general health of the animal has not suffered, cleanse the parts well with tepid water and castile soap, and make occasional applications of No. 2, or the camphorated corrosive sublimate, say once a day, till a cure is effected. A few applications will generally be found sufficient.

If the horse is thin in flesh, and in a low state of health from the effects of this disease, mix sulphur and rosin, in the proportion of two

parts of the former to one of the latter, and give him a quarter of a pound of this every third day until he has taken three or four doses. Meanwhile, thoroughly saturate the parts at least every other day with No. 2 till the disease is thoroughly conquered.

If the liniment forms a scab upon the heel, so hard and dry that the remedial effects seem to cease, omit the liniment for several days and keep the heel well greased. The scab will come off, and then the application of the liniment, (No. 2), may be resumed. This course must be persevered in till a cure is effected.

The liniment should be applied at night; and the horse should not be turned into pasture when the grass is wet with dew or rain—at any rate, not till six hours after the application has been made.

In Summer, pasturage will in general afford sufficient food; but in Winter it should be more nourishing, yet green and succulent as far as possible. Roots and good bran mashes ought to be given in reasonable quantity. Grain, as a regular diet in this case, is objectionable, on account of its tendency to produce inflammation.

After three doses of the sulphur and rosin have been given, as directed, the following mixture, given every night until all traces of the active disease have disappeared, will be found an excellent tonic or strengthening medicine, and having the effect, too, of giving healthy tone to the skin:

No. 3.
½ Oz. liquor of arsenicalis,
1 Oz. tincture of muriate of iron,
½ Pint of water.

This constitutes a dose. Mix and give as a drench.

When it is difficult to procure No. 2, the following may be prepared and substituted therefor:

No. 4.
8 Oz. tar,
1 Oz. beeswax,
1 Oz. rosin,
1 Oz. alum,
1 Oz. tallow,
1 Oz. sulphate of iron,
1 Drachm carbolic acid.

Mix, and boil over a slow fire, stirring as long as dirty scum appears, and then add 2 oz. of the scrapings of sweet elder.

III. Thrush.

Causes.—This, like scratches, results for the most part from foul stables,—the horses being forced to stand in mortar of dung and urine,—or from working in muddy and filthy places, without having his feet and legs well cleansed when he is unharnessed for the night.

It is sometimes caused by injuries to the frog of the foot, as bruising, snagging, and improper shoeing.

It may arise also from a gross habit of body, producing inflammation of the sensitive frog, when a spongy substance is deposited instead of sound horn; and this breaks away and leaves the frog ragged and tender.

Again, it may come from too frequently stopping soft frogs with cow dung, as is the practice of some grooms, thus encouraging rather than curing decomposition.

Lastly, it may be secondary, having resulted from other diseases, superinduced by want of cleanliness and care.

How to Know It.—In some cases, the only means of detecting the existence of thrush is a peculiar smell, or by very careful examination, as the hoof may show no change, and the frog may not be tender. In this case the cleft of the frog will generally be found lengthened and deepened, the opening extending to the sensitive horn within, and this, when thus closely observed, shows discharge of matter.

The progress of the disease is often slow, though showing meanwhile no disposition to heal; till after awhile the frog begins to contract, becomes tender, grows rough and brittle, and emits a more offensive discharge. The horny part disappears, and a hardened substance takes its place; this easily scales off and leaves the sensitive frog uncovered.

In its advanced state, it is very easily detected, as it is characterized by a continuous discharge of offensive matter from the cleft of the frog. If not reasonably attended to, proud flesh sprouts up; and as this spreads the whole foot becomes involved in canker.

What to do.—In the first place, if the causes which have produced the disease are still in operation, remove these. In any case, when the horse is to be stabled, use dry litter, and see that the stall is kept clear of moist excrement, and that it is well ventilated.

If the disease is secondary, the treatment must of course be directed to removing the affection from which it has sprung.

In its simple stages, it may be easily cured in the following manner:

Clean well with soap suds, and allow to dry. Then, wet a piece of cloth or string of tow with the liniment No. 2, and press it into the cleft of the frog and the corresponding part of the heel. Remove the tow next morning. Continue this treatment, (putting in the saturated tow at evening), for four days; then omit a day; and so on until a cure is effected.

Or, sprinkle a small quantity of blue vitriol in the cleft of the frog, and then fill up the cavities with cotton, which so press in as to keep out all dirt. Repeat until the foot is cured.

When it has arisen from grossness and inflammation, rather than from filth or other local cause, give a dose of Epsom salts, from six to eight ounces, according to degree of inflammation; use less stimulating food, and give him regular, but not too severe exercise every day. The local application must not be of a stimulating character. Put the foot in a bran poultice, and let it remain for some days, till the inflammation is reduced. Be careful, however, not to use the poultice too much, as undue softening is injurious. Then dress the frog with tar ointment, (a mixture of equal parts of tar and grease). If the frog is found not to harden by the application of the tar ointment, moisten it occasionally with a solution of 10 grs. of blue-stone to 1 oz. of water; or, (which is a somewhat more powerful medicine), 5 grs. of chloride of zinc to 1 oz. of water.

When the disease has become chronic, it is hard to effect a cure, and the following course ought to be adopted: Clean away all the ragged portions of horn, so as to reach the sensitive parts. Then smear some tow with this ointment.

No. 5.
1 Drachm ointment of nitrate of mercury,
1 Oz. zinc ointment,
4 Drops creosote.

Mix well; and having smeared the tow with the preparation, as directed, press it into the cleft of the foot and retain it there by a bar shoe, slightly tacked on. Apply this every day, observing its effects. If found not to do well, try a wash made of six grains of sulphate of zinc, dissolved in one ounce of water. As the frog grows, it should be kept supple with tar ointment. The bar shoe should be kept on until the frog is fully developed. Some degree of pressure must be employed by means of tow, and this pressure should be increased as the horn increases in substance. When proud flesh is obstinate it may be burnt away at once by forcing a stick of nitrate of silver (lunar caustic,) into it.

In chronic cases, the horse should have, once a day, in his food, an alterative dose, (a mild improver of health), say a table-spoonful of sulphur and powdered sassafras, of each an equal quantity.

The following mixture is sometimes found valuable when there is a tendency to proud flesh. The ingredients are to be well stirred together and sprinkled into the cleft of the frog, where it must be confined in the same manner as directed for powdered blue vitriol alone:

No. 6.
1 Oz powdered blue vitriol,
1 Oz. copperas,
2 Oz. burnt alum,
1-2 Oz. white vitriol.

IV. Swelled Ankles.

Causes.—This affection invariably arises from a diseased condition of the feet. Its origin may sometimes be traced to diseases of the navicular and lower pastern joints; but it is known to proceed for the most part from hoof rot. It seems occasionally, however, to result from a plethoric condition of the general system, a superabundance of blood, hard work, severe strains, etc., etc.

How to Know It.—Confined almost wholly to the ankle joints, it is not difficult of detection—the only point of importance being to determine whether the swelling is merely spasmodic and temporary, or whether it is the result of a primary disorder which requires attention. It is generally perceptible of a morning, and disappears during the day, because exercise restores healthful action; but when there is really a diseased condition of the bottom of the foot, the fever caused thereby inflames the membrane of the joint, under the skin, while the horse is inactive, and the swelling again takes place. If the ankles present a swollen appearance from morning to morning, attention should be directed to discover the real condition of the foot; and appropriate treatment must be resorted to before the disease takes the chronic and more advanced form of swelled legs, cracked heels, or scratches.

What to do.—If the swelling proceeds from plethora, or too great fulness of the general system, give an occasional dose of Epsom salts, to reduce the tendency to inflammation; and feed upon green and succulent food.

If it proceeds from soreness of the bottom of the foot, apply No. 2 freely every day for four days; then omit for two days, and apply again. If there is any appearance of thrush or cracked heels, treat as directed for the removal of these.

V. Swelled Legs.

Causes.—Swelled legs may be the result either of an undue deposit of serum or watery particles of the blood, or of inflammation of the cellular tissue lying between the skin and bones in those parts of the leg most destitute of muscles.

A poor condition of the blood, or feebleness from great loss of it, may cause the legs to swell, since the fluids conveyed to the extremities by the capillaries accumulate there, because, in the absence of muscular activity, the veins have no power to return them. Diseased kidneys have a tendency to produce this disorder of the legs.

The inflammatory type may result from blows upon the lower leg; from concussion; or, in general, from anything that may arrest the

action of the cellular tissue referred to, causing it to become dry and at length acutely inflamed. It may also arise from the shifting of inflammation from other parts, as from the lungs, kidneys, etc.

Horses of coarse fiber and full habit, accustomed to exercise, if allowed to stand idle several days, will have swelled legs from the accumulation of watery fluid; and, if unattended to, the parts may soon be attacked by inflammation, when the tissues become involved, and the disease assumes its more serious type.

It is occasionally a mere extension of the effects of cracked heels, with its primary cause resting in whatever may have produced the primary disorder.

How to know it.—The leg becomes greatly swollen, and looks as though it was stretched to its utmost tension. Occasionally, the swelling appears almost suddenly, and then as suddenly subsides, in which case the cause may be considered as having but just begun to operate; and if now treated, it is easily managed. Again, it is sometimes sudden in its attack, and violent; the skin is hot, dry, and extremely tender, and the pulse is quick and hard, while a peculiar lameness speedily sets in. The swelling may extend to the sheath and along the belly, as far as the muscles of the breast.

In the more advanced stage of the disease small cracks appear in the skin, and from these exudes a watery matter, of whitish-yellow color, similar to that which is seen in cracked heels. In this case it must be taken for granted that no treatment, however skilfull, can speedily remove it; that the improvement must be slow, and consequently much time required.

What to do.—If the disease seems to be merely undue deposit of serum, owing to confinement, nothing more may be necessary than to give the animal a dose or two of niter, daily, to act upon the kidneys; and to exercise him regularly, to induce absorption. In the administering of a diuretic, however, even so simple as niter, care should be taken that it is not left to ignorant and irresponsible grooms, since it may be given in excess, and result in disordering the kidneys, and thus ultimately inducing the very disease which it is intended to remedy.

When there is a tendency to swelled legs which manifests itself in the morning, but disappears during the exercise of the day, an excellent preventive is to stand the horse in cold water to his knees, half an hour, just before night, and then rub dry before stabling; but care must be taken to dry the legs thoroughly, or the plan is plainly objectionable. If it should be found not to yield to this, administer the niter in moderation, as previously directed, and exercise the horse regularly, causing him

to sweat, both of which have a tendency to diminish the accumulated fluid, and to assist the veins and absorbents in their functions.

In case the horse is in a debilitated condition, and the swelling is manifestly owing to the sluggishness of the circulation, he should be well fed, on nutritious diet, and the leg or legs should be firmly, but not tightly, bandaged. Then prepare the following—a tonic and somewhat stimulating medicine:

No. 7.
½ Oz. pulverized assafœtida,
1 Oz. cream of tartar,
2 Oz. powdered gentian,
2 Oz. African ginger,
4 Oz. finely pulverized poplar bark.

Rub these ingredients together in a mortar until thoroughly mixed. Divide this into six doses, and give one, in the food, every night till exhausted. The bandage should be removed from time to time, and the limb subjected to a brisk hand-rubbing, or rubbing with a medium coarse cloth.

If the disease has become chronic, and the animal is much debilitated, the following more stimulating medicine should be used.

No. 8.
1 Oz. powdered golden seal,
1 Oz. gentian,
1 Oz. balmony, (or snakehead),
½ Lb. flax seed.

Mix well; and divide into six doses, of which give one night and morning in the food. Bandage and rub alternately, as previously directed. If the disease does not speedily show signs of yielding to this treatment, apply, every night, omitting the bandage, the following liniment:

No. 9.
2 Oz. essence of cedar,
1 Oz. tincture of capsicum,
1 pint new rum.

When cracking of the skin has taken place, so that matter exudes, and there is much fever, the following course has been found eminently successful, and must be at once adopted: First, take from the neck vein three quarts of blood. Mix finely pulverized sulphur and rosin, in the proportion of two parts of the former to one of the latter; and give daily, for three or four days, six ounces of this mixture. It should be put into meal or bran, and the horse should be allowed no other food until he readily takes this. Meanwhile, apply No. 2 every morning to the parts most evidently affected, until the swelling has entirely subsided.

In these chronic cases, it is best not to feed on very nutritious or at

least, stimulating food, unless the horse is in low general condition. Ordinarily, pasturing will be best, when the season admits of it. If it does not, he should have light, moist diet; and his stable should be clean, dry, roomy, and so supplied with litter as to induce him to lie down as much as possible.

VI. Surfeit.

Causes.—This disease, sometimes known as prurigo, has for its predisposing cause a thick and impure state of the blood, with deranged condition of the digestive organs. When the animal is in such case, any sudden exposure to chill, especially when he has been heated, will produce surfeit-pimples; and unless the general condition be attended to, a confirmed case of skin disease may be the result.

It generally appears in the Spring, at the time of shedding, when the skin is more exposed than at any other time of year, and the horse is still exposed to sudden spells of cold and wet weather. The skin, thus bare, is easily affected; and if the chill is severe or too frequently repeated, inflammation sets in, and the cuticle or outer skin becomes hard and dry because the pores are so closed as to retain the oily secretions necessary to moisten the surface.

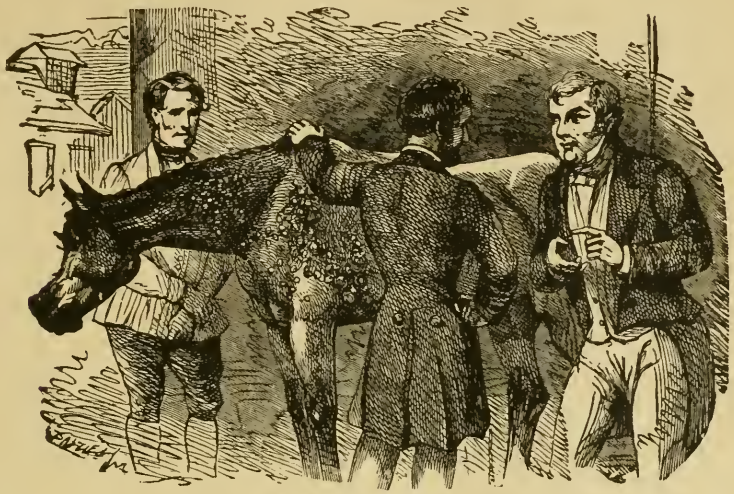
Some poisonous herbs produce this, or a similar, eruption of the skin, and musty hay has been known to have a like effect.

Quick surfeit, or that which arises suddenly, even in animals in good general condition, upon being overheated and suddenly cooled by chill air or an over-draught of water, may disappear upon his being brought to a sweat by exercise; but that which is contracted while the horse is in general ill condition is apt to become confirmed, and, unless timely attention is bestowed, may settle on the lungs and cause serious trouble.

How to know it.—No symptoms precede an attack of surfeit by which its approach may be known. The pimples or lumps, in quick surfeit, suddenly appear, and almost as quickly subside. When a case of confirmed surfeit has set in, the skin is hard, dry, and feverish; and pimples appear, sometimes confined to the neck, but more frequently spread over the sides, back, loins, and quarters. Occasionally, these are attended with great itching, while again they seem to cause no annoyance. When they have remained a few days, they discharge, in small quantities, a thin, whitish, oily matter. Small, scabby excrescences, formed by the discharging sores, cover the parts. These come off, taking the hair with them, and leaving a small scaly spot—sometimes, though rarely, a sore.

Surfeit is sometimes mistaken for button-farcy; but it may be distinguished from this by the shape of the pimples: in surfeit these are

elevated in the center; whereas, in farcy the lumps are rather flat on top and have thick edges, like a button in the skin. Farcy buds generally



A HORSE AFFECTED WITH SURFEIT.

appear on the inside of the thighs and fore legs, while surfeit pimples are seldom found in these places.

If not promptly and properly attended to, surfeit is likely to degenerate into mange, which it is sometimes taken to be, even in its early stages; but it may be known from mange by trying the short hairs at the roots of the mane: if it is mange, they will be loose and come out, but if surfeit, they will show their natural condition.

What to do.—If the general condition of the horse is good, and the affection has evidently arisen from sudden exposure or some other imprudence on the part of the person having him in charge, little treatment will be necessary. Prevent costiveness and keep down fever by cooling food, such as bran mashes, roots, and other moist provender. Give arsenical drink once a day, a pint at a time, to act on the skin, until cure is effected, being careful, meanwhile, if the weather is cool, to keep the horse comfortably warm—blanketing him if necessary; and a half hour's walking exercise should be given him daily. The arsenical drink consists of these ingredients in the proportions named:

No. 10. 1 Fluid oz. arsenicalis, or Fowler's solution,
1 ½ Fluid oz. tincture of muriate of iron,
1 Quart water.

If the disease has sprung from a thick and impure state of the blood, disordered digestive organs, and general ill condition, take from the

neck vein from three to five quarts of blood, according to strength, extent of eruption and degree of fever. Keep him from becoming costive by cooling and laxative food, as previously directed; see that he is comfortably stabled, if the weather is at all inclement, and give, on several successive nights, the following alterative:

No. 11. 2 Drachms levigated (finely ground) antimony,
3 Drachms niter,
4 Drachms sulphur.

The food should be good—if possible, green and succulent; and it will be found advantageous to take the chill from water given him, if the weather is at all cold. If the appetite is bad, place gruel in the manger, so that he may use it instead of water till stronger food is relished.

If it is Summer, or Spring is sufficiently advanced to be mild, he may be turned to pasture; but in any event, he should be allowed to rest during treatment.

In the more confirmed cases a speedy cure is not to be expected; but good food, not of a nature to induce costiveness and inflammation, and proper care as to warmth and cleanliness, together with a proper use of No. 11, will bring the patient round in time.

In very obstinate cases, occasionally anoint those parts where the lumps appear with a mixture of sulphur and lard, in equal proportions.

VII. Mange.

Causes.—This is sometimes brought about by the same causes as surfeit; or rather, it is indeed but an advanced or chronic stage of that disease; though in some cases of the same kind, it is of a much more serious character in itself, and highly contagious.

When not a mere secondary stage of neglected surfeit, its immediate cause is a parasite—the acarus—bred in the skin of the animal when subjected to dirt and filth, and debilitated by hard living and ill usage, or by total neglect and lack of food. The acarus produces mange in the horse in the same manner as the human parasite produces itch in man; but it is of a different species, and frequently so large as to be visible to the naked eye.

Neglect, starvation, and accumulated filth having induced a depraved state of the digestive apparatus, with which the skin sympathises, and the insect once having obtained a lodgment, the horse, unless promptly taken in hand, soon becomes a loathsome object, and dies.

The disease once contracted in this way, may be communicated to even sound animals, in good condition; in fact, the great majority of cases are thus contracted, as comparatively few animals are so utterly neglected

or exposed to filthy influences as to become in themselves the generators of these mange-breeding insects. It is regarded as one of the most contagious diseases to which the horse is subject, and may be imparted not only to other horses, but to cattle, hogs, and dogs, though it is asserted by good authority that none of these can in turn communicate it to the horse.

The curry-comb, brush, collar, or blanket which has been used on a mangy horse will produce the infection in another; and to lie in the same stall or to rub where a mangy horse has rubbed himself is almost certain to communicate it unless the animal so exposed is exceedingly healthful and in active condition of body.

How to Know It.—The skin is at first scabby, the hair comes off, and the outer skin becomes broken into little scale-like pieces. These fall off, or are rubbed off, and leave the parts raw and sore. The general appearance of the skin where the raw spots are not too numerous is a dirty brown, and it is loose, flabby and puckered. The horse is impelled by itching to rub himself frequently and violently, and he thus leaves his scurf, dandruff, and in the more advanced stage, his parasites, at every place.

Usually, where the disease is engendered in the animal itself, it appears first on the side of the neck, just at the edges of the mane, and on the inside of the quarters near the root of the tail. From these parts the eruption extends along the back and down the sides, seldom involving the extremities, except in the very worst cases. Sometimes, though rarely the ears and eye-brows are attacked and left bare.

When it is the result of contagion, the horse may at first be in health; but the constant irritation makes him feverish, the hair falls off as in the first case described, leaving the skin in those places almost bare; and little red pimples appear here and there. Each of these contains a parasite, and the pimples are connected by furrows along which the parasites have worked their way. In time they increase in number and size, and from them exudes a matter which hardens into a scab. Under these scabs the parasites may be found, upon removing them and carefully examining in the sunlight.

In the early stage of the disease, where it may be suspected, but is not yet fully manifest, it may be detected by placing the fingers among the roots of the mane and tickling the skin with the nails. The horse is so sensitive to titillation when in this condition that he will thereupon stretch out his neck and evince the most unmistakable pleasure as long as the tickling continues.

What to do.—The most effectual preventive, it will be readily inferred

from the preceding statement of causes, is cleanliness. In no case should a healthy animal be allowed to occupy a stable where a mangy one has been kept until it shall have previously been washed with water strongly impregnated with sulphur and chloride of lime—say half a pound of powdered sulphur and one pint of chloride of lime to each gallon of water. If the stable is thoroughly cleansed of loose litter and dirt, and all parts that may have been rubbed against by a mangy horse perfectly saturated with this solution two or three times, on as many consecutive days, there can be no danger in using it. Clothing, curry-comb, brush, etc., that may have come in contact with such animal, should be burned up.

If starvation, weakness, and general ill condition have caused the mange, a patent means for its removal will be found in giving him clean quarters and good nourishing food; which, however, should not be at first of a heating nature. Generous pasturage, unless the weather is damp, will be sufficient; otherwise, a full supply of oats and chop food should be given. It cannot be too much insisted upon that especially while treating a horse for disease his stable should be dry, well ventilated and properly supplied with litter.

In cases of full habit of body, where the disease is the result of contact, and the presence of high fever is noted, bleed once, taking from the neck vein from three to five quarts, according to the condition of the animal and the degree of fever; but if it is the result of poverty and debility, do not bleed at all.

Next, have him as thoroughly cleansed of scab and dirt as possible, with a wisp of hay, and by softly and lightly using a curry-comb. Then prepare a liniment of the following ingredients and in the proportions here given for greater or less quantities:

No. 12.

1 Quart animal glycerine,
1 Gill creosote.
½ Pint turpentine,
1 Gill oil of juniper.

Mix all together and shake well; and with this saturate the whole skin, as nearly as possible, rubbing in well with a soft cloth. Care must be taken to rub it in thoroughly. A little well rubbed in is better than much merely smeared on.

Leave him in this condition two days; then wash him well with warm water and soft soap; stand him in the sunshine if the weather admits, and rub with a wisp of hay or with suitable cloths until he is dry; after which, anoint him pretty well all over with the mixture described, No. 12, and *rub it in*. This course should be pursued until a cure is effected.

Two to four applications will generally be found sufficient, even in obstinate cases, if care is taken as to food and drink. The following alterative will be found beneficial:

No. 13.
1 Oz. tartarized antimony,
2 Drs. muriate of quicksilver,
3 Oz. powdered ginger.
3 Oz. powdered anise seeds.

Mix with mucilage so as to form a consistent mass; divide into six balls, and give one every morning till the eruption disappears.

Care must be taken that the patient is not exposed to rain or heavy dews while under this course of treatment.

VIII. Ringworm.

Causes.—There are two kinds of ringworm; one simple, of spontaneous origin, and non-contagious. The other contagious. The first is usually the result of indigestion or confinement in close and foul apartments, as in filthy and ill-aired stables, railroad cars or ship holds. The latter, or contagous kind, is found on horses of good condition, as well as on diseased and neglected ones, and is produced by vegetable parasites in the hairs and hair-glands.

How to know it.—It is especially common in Winter and Spring, and appears on the face, neck, shoulders, sides, and sometimes elsewhere.

When non-contagious, it may usually be known by its appearing as an eruption of small blisters, about the size of a wheat grain, on inflamed patches of skin. These assume a circular form; and if not seasonably attended to, the circle enlarges and covers fresh portions of skin.

The contagious type appears in round, bald spots, covered with white scales, and surrounded by a ring of bristly, broken, or split hairs, with scabs around the roots, and some eruption on the skin. These broken hairs soon drop out, and a wider ring is formed. The most marked characteristic of the contagious or parasitical ringworm is the splitting of the hairs in the ring, and the perfect baldness of the central part.

Occasionally the patches, in either form of the disease, assume an irregular rather than a really circular form.

Any attack of this sort is usually marked also by the horse's rubbing and scratching himself against the sides of his stable, or convenient objects outside; but this is not to be depended upon as a marked symptom, since it likewise indicates surfeit and mange.

What to do.—If a simple, non-contagious case, shave the hairs as closely as possible from the affected part, and paint with tincture of iodine; or, if scratches or little ulcers have appeared on the patch, rub it with the following stimulating and healing ointment:

No. 14. 10 Grains nitrate of silver,
1 Oz. lard.

If it is a case of the contagious or scaly variety, wash the patches thoroughly with soft water and soft soap, and then rub every day with the following ointment:

No. 15. ½ Drachm iodine,
1 Drachm iodide of potash,
1 Oz. cosmoline.

If through neglect and long standing it has ulcerated, use this ointment twice daily:

No. 16. 6 Oz. pyroligneous acid,
5 Oz. linseed oil,
2 Oz. spirits of camphor.

If it has become obstinate—not yielding to the foregoing treatment—apply a blister directly over the patch, and then treat as for a common sore, using some simple ointment.

If there are signs of constipation and fever, care must be taken to keep the bowels open and regular, and to avoid stimulating grain food. A seasonable supply of cut grass and sliced potatoes, or of carrots, if they can be obtained, should be allowed. If in Spring and Summer, and the horse is not in active use, put him to pasture for a few days.

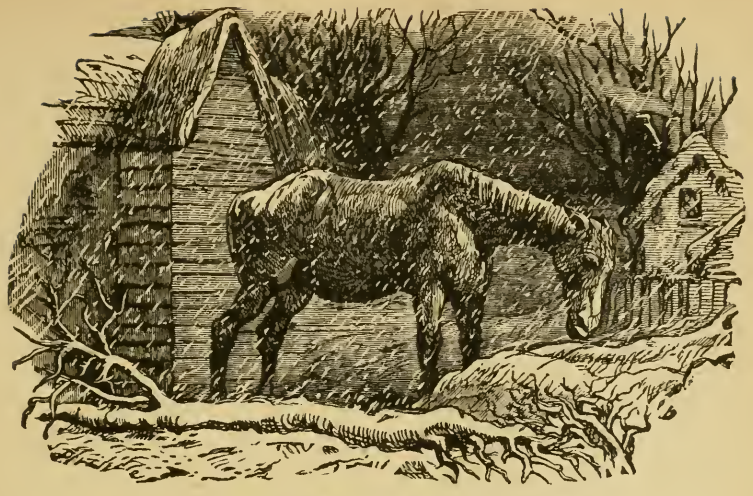
When the horse shows a tendency to weakness, as is sometimes the case with young animals, and with those suffering from neglect, give good nutritious food, and tonic medicine in moderation.

To prevent spreading the contagious form, clean the stable where a horse so afflicted has stood, and white-wash its interior thoroughly. Wash the harness, collars, and whatever else may have covered the ringworm, with strong soap and water, and rub them over with a solution of corrosive sublimate, (one drachm to a pint of water.) If the horse has been blanketed while suffering with the disease, the blanket should be well boiled.

IX. Hide-bound.

Causes.—Strictly speaking, this is not of itself a disease, though the skin is in a peculiarly abnormal condition, but the result of a diseased condition of the general system or of derangement of some specific vital function. With respect to the causes from which it arises, it is somewhat similar to mange; but, unlike mange, it is neither eruptive nor contagious.

Poverty and cruel usage—the food being deficient in quantity or



One of the Causes of Hide-bound in Horses.

quality, and the labor onerous—bring on impaired digestion; the blood becomes thick, dark, and feverish, because the secretive processes are sluggishly performed; the skin sympathizes with these internal disorders, and the lubricating fluid through the pores is suspended; and then, instead of remaining soft and pliant, it becomes dry and adheres to the body. A disordered state of the stomach, bowels, and urinary and respiratory organs may be considered as having produced it when no specific form of disease can be discovered as existing; but it is an almost invariable accompaniment, in a greater or less degree of intensity, of big head, glanders, grease, farcy, founder, distemper, bad cases of swinney, big shoulder, lock-jaw, consumption, and chronic dysentery. The fever in these dries up the watery secretions and shrinks the hide.

Formerly it was supposed to be caused by worms in the stomach and alimentary canal; but this is erroneous. Worms may of course exist while the horse is in this state, but they are rather a consequence than a cause—the result of imperfect digestion and excretion. The skin, as has been elsewhere stated, sympathizes readily with the vital internal organs, and in all obscure cases hide-bound should be considered a symptom of disorder in these, and treated accordingly.

How to know it.—The skin is dry and hard, and the hair is rough and rusty. Both are evidently destitute of that oil by which in health they are kept in soft, pliant, and glossy condition. Adhering almost immovably to the ribs, legs, neck—almost every part of the body—the skin cannot be caught up in folds with the hand. At times it appears scurfy, and the exhalants, (having the quality of giving out or evaporating), pour

forth unusual quantities of matter, the more solid portions of which form scales and give the horse a filthy appearance.

The excrement or dung is dry, hard, and black.

What to do.—Especial pains must be taken to discover, if possible, what specific disease has given rise to this state of the skin. If the cause is obscure, direct the treatment to restoring a healthy condition of the digestive organs. Begin by bettering his treatment in every way. Instead of hard labor, he should have only gentle exercise, and instead of being left exposed to the rain, snow, and merciless winds, in barren pasture land or filthy barnyard, he should be well sheltered, and, in Winter, blanketed—using for this purpose two blankets joined along his back by tapes so that a space of an inch or two may be left for the escape of insensible perspiration. Instead of allowing the skin to grow clogged, torpid, and dead for want of cleanliness and friction, he should have regular daily currying and brisk rubbing with good brush or coarse cloth, which will materially aid in restoring healthy action of the skin.

If it is pasture season, give him a run at good grass during the day; but stable at night in a clean stable, furnished with dry litter, and give him a generous feed of bran and oats, or moistened bran and chopped hay. Mix with the food night and morning, the following alterative:

No. 17	3 Oz. powdered sasafras bark, 3 Oz. sulphur, 3 Oz. salt, 2 Oz. bloodroot, 2 Oz. balmony, 1 Lb. oatmeal.

Mix, and divide into twelve doses.

If he appears in the beginning of the treatment to be filthy, feverish, and stiff, bleed him—taking from the neck vein three quarts. If the stiffness continues, bleed again after seven days, taking a like quantity.

If the appetite is bad, mix with No. 17, (the alterative above described), a spoonful of ground ginger; but in general you should avoid cordials, tonics, and aromatics, (that is, warm and pungent medicines). They may arouse fever that would otherwise fail to develop itself, and thus defeat the object for which the mild laxatives and temperate alteratives prescribed have been given. Cordials may indeed arouse the vital functions to sudden action; but even if no lasting fever is created, the action soon subsides, rendering it necessary to continue the cordial or forego whatever seeming advantage may have been derived from it. If excitment is continued by this means, the powers of nature are impaired and lasting injury done.

A good and sufficient tonic may be furnished, of which the horse will

partake as much as the system requires, by placing a poplar pole in the stable, upon which he can conveniently gnaw.

If the time is Winter, it will generally be found necessary to begin the course of treatment by giving a purgative, say two ounces of Epsom salts, which may be repeated within seven hours if it fails to produce the desired action; and to feed him on laxative food until constipation is overcome and a healthful action of the bowels restored.

Remember that one of the very first objects is to establish regular action of the bowels; and then generous diet, (let it be green and succulent if possible, but at any rate nutritious without being inflammatory), with cleanliness and regular friction of the hide, will do more than medicine. Do not expect to effect a speedy cure; in any event, the very existence of hide-bound indicates chronic disorder, and all chronic diseases require time.

If it is known to be the result of a well-defined disease, as big-head, farcy, etc., the treatment must of course be directed to the removal of that, according to directions elsewhere given in this work; and the hide-bound will disappear as its immediate cause is removed.

X. Saddle Galls, or Sit-fasts.

Causes.—These are swellings, sores, and tumors, caused by ill-fitting saddle or harness. Different names are applied to them according to their appearance and character. When a mere heated swelling on the horse's back or shoulders is unattended to, while he is kept in constant use, it sometimes assumes the appearance of a dead patch of skin, and is then called a *warble;* when these ulcerate and discharge pus, and a leather-like piece of skin is firmly fixed upon the top of it, the name *sit-fast* is applied; and when, by the use of saddle or harness before a warble or sitfast is thoroughly healed, a hard, callous lump is formed, it is called a *navel gall*—said to be so called because it is generally on that part of the back opposite the navel.

How to know it.—These swellings, sores, and tumors require no further description than has already been given.

What to do.—The first and most essential thing is, that the animal shall be allowed to rest; or at any rate be subjected to such labor only as will not require the same chafing, abrading saddle or harness which has produced the trouble.

Then, if it is merely a gall or scald—a heated, tender swelling, without either suppuration or hardness—bathe with cold salt and water two or three times daily. When the heat and tenderness are sensibly reduced, anoint occasionally, until the lump has entirely disappeared, with a mixture of tar and olive oil, equal parts.

If it has assumed the character of a sitfast, do not use the knife, nor try to tear the dry skin away, but bathe with warm soft water, and then apply a poultice. This must be repeated, if necessary, until the callous skin is easily removed, and then anoint frequently, until the sore is healed, with the following:

No. 18. 1 Dr. iodide of potash,
6 Drs. simple ointment,
2 Drs. glycerine.

When it has reached the stage of navel gall—hard, grisly, almost horny—apply daily the camphorated, corrosive sublimate, No. 2. Shake the bottle well before pouring it out; use a mop with which to put it on; then, when it is thoroughly saturated with this liniment, use a hot iron with which to dry it in.

When one finds his horse suffering in this way under saddle or harness, his own interests, as well as the promptings of humanity, demand that he shall at once remove the cause, if possible; but it is sometimes the case that this cannot be done—absence on a journey, military necessity, press of farm or road work, requiring regular service. Under these circumstances the saddle or harness should receive immediate attention and subsequent watchfulness on the part of the rider or driver. The padding must be taken out of the saddle or collar so as to obviate pressure on the part affected; or, as for the saddle, the blanket may be so arranged as to lift it from the spot. The sore place must be bathed well with salt and water as soon as possible after it is discovered; and then covered with a piece of adhesive plaster, heated, of course, until it sticks readily. If matter has formed, a hole should be cut in the middle of the plaster to allow it to escape.

Treated in this way, the horse may be ridden from day to day, and recover while in use.

Greasing collars and other parts of harness will frequently prevent that chafing which results in sores and callous tumors.

If the horse, through constitutional tenderness, is subject to these swellings and sores, it is well to put the saddle on half an hour before using him; and leave it on, having slightly loosened the girths, for a half hour or an hour afterward, thus preventing sudden change in the temperature of the skin.

XI. Fungous Collar Tumor.

Causes.—This in its nature is essentially the same as that described in the preceding section as saddle gall, or sitfast—differing, however, in location and specific cause. It is an inflammation and swelling beneath

the large flat muscle that covers the front of the shoulder, and is caused by the chafing of the collar.

How to know it.—It is scarcely necessary to undertake farther description of a well-known, visible affection. It is usually found near the point of the shoulder; and the character of the tumor as to simplicity or severity can be readily determined by examination. If of considerable standing, it will be found so hard as to render it almost impossible to detect any fluctuation that would indicate the presence of matter. Where there is much swelling, however, there is almost invariably matter, and no cure can be effected until this is removed. In cases less marked there will be a small, hard or indurated lump without matter.

Under similar conditions as those mentioned in the preceding section, it may form a leathery patch in the center and become a real sitfast.

What to do.—The tumor must, if possible, be so treated as to leave no scar or lump, as this would be easily irritated by the collar upon subsequent use, and prove a source of constant trouble. The first thing in order will be to take the horse from work, if at all practicable. If not, use a breast-strap, so as to prevent all further chafing. If the swelling is recent, apply cold water often, or cover the part with a wet rag hung over the shoulders in such a way as to remain in contact with the swelling. This must be kept constantly wet.

But if the tumor is large, and of long standing—already hardened and containing matter deeply hidden, open with a knife—making a smooth, vertical cut, and of sufficient depth to thoroughly evacuate the pus. Syringe the opening well every day with the following solution:

No. 19. 30 Grains chloride of zinc,
1 Quart water.

If the wound seems inclined to heal and leave a hard lump in doing so, discontinue the injection, and rub frequently with the following liniment to promote the absorption of the callous or gristly formation:

No. 20. 1 Oz. iodine,
12 Oz. soap liniment.

XII. Warts.

Causes.—It is difficult to point out anything that may be implicitly received as the cause of these excrescences. Generally accompanying a plethoric condition, they may be considered as owing their origin primarily to high feeding and insufficient exercise. This, however, must not be taken as conclusive, since they not unfrequently appear upon active animals, of meagre habit.

The manner of their formation seems to be this: Knots in the true skin are gradually developed, being surrounded with a covering of the scarf-skin, something thickened and matted together; and this outer covering generally dries and splits into fibers towards the top, while blood, in greater quantities than usual, is sent to the inner or vascular parts; and more nutriment is thus diverted to it than to the surrounding flesh, so that an upward or outward growth is promoted.

Seed warts usually make their appearance on the eyelids, the nose, the sheath and adjoining parts of the belly; the encysted or sac warts, on the pasterns, hock-joints, and knee-joints, and sometimes upon the sheath and neighboring parts.

Unless warts appear upon the penis they are not injurious to health, and at first occasion little inconvenience unless upon the shoulder or some part where harness or saddle touches constantly; but they should be removed, nevertheless—particularly the sac wart and those seed warts which manifest a tendency to enlargement. If the encysted or blood wart is allowed to remain it will almost invariably enlarge and spread.

How to know it.—There are two kinds of these formations, one of which is fibrous, white, and gristly or cartilaginous, but somewhat spongy lump, contained in a sac or cell which has taken its rise from the outer or scarf-skin; and the other is a somewhat cartilaginous substance, not inclosed, but adhering firmly to the skin—a hard excrescence,—the "seed wart,"—which is too well known to require particular description. It is sometimes difficult to distinguish the blood wart, as the former is sometimes called, from the seed wart; but it generally presents a more rounded, smooth appearance, and sometimes hangs as by a little stem, in which last case it is readily known.

What to do.—If there is doubt as to the character of the wart, the matter may be speedily determined by running a sharp-knife through it; when, if a blood or sac wart, the contents will come out, accompanied by more or less copious bleeding; whereas, the seed wart will in this case be merely divided by the incision, each part retaining its firmness or consistency.

When the blood wart is thus opened, nothing more will be necessary than to touch the part with a solution of chloride of zinc, one grain to the ounce of water, or lunar caustic. When these warts are attached to the skin by narrow bases, or small stems, they may be clipped off with knife or scissors, and the part slightly burned over with caustic as previously directed.

If the growth is of the fixed kind, or seed wart, remove by means of scissors or knife when standing singly; but if the stem or base is large,

or if the warts grow in bunches, too numerous and too close together to be cut away, pick off or otherwise chafe the rough outer surface so as to make it bleed; then with a stiff brush rub in yellow orpiment wetted with a little water, and in a few days they will come away, or may be rubbed off, and leave a healthy sore, which soon heals. If the entire wart does not come off by reason of one application, repeat.

When the penis is wholly covered with warts, the best plan is to have it amputated, as the warts cannot easily be removed without destroying as much of it as it would be necessary to remove entirely in order to be rid of them.

XIII. Vermin.

Causes.—Vermin are both a cause and a consequent of skin disease; and being also bred in the hairy covering, perhaps in the very skin itself, they are properly treated in this connection.

Every species of animal is more or less troubled with his own peculiar insect tormentor; and while no well-defined cause can be assigned as to their origin, they are almost always found associated with filth and squalor.

They sometimes, however, trouble animals of fair condition, and accustomed to reasonable care; but in this case they are caught by contact.

Poor, ill-cared-for, mangy horses, colts in the Spring of the year, with long, uncurried coats, and old and feeble horses with like rough and shaggy covering, most probably breed them; and on these they are most frequently and plentifully found.

The itching torment to which they subject diseased animals doubtless intensifies whatever disorder may exist; and the very earliest opportunity should be taken to eradicate them from the sufferer.

When horses stand in proximity to a hen-house, they are often seriously annoyed with hen-lice, which are even more tormenting than those peculiar to the horse himself.

How to know it.—The horse infested with vermin will usually manifest his uneasiness by biting and rubbing himself; but their presence may be unmistakably detected by a more or less careful examination of his coat.

What to do.—If the horse is suffering from some skin disease requiring treatment, the means adopted for this will almost invariably suffice of themselves to remove the vermin; but where no such disease exists, and it is a simple case of lousiness, anoint him with the following salve:

No. 21. 1 Dr. carbolic acid crystals,
1 Quart fresh lard.

Rub it upon every part of the body thoroughly; wash with warm soap suds next day; repeat if necessary—at last washing and drying.

Attention to his general health will also be demanded; and to this end he should be upon good pasture, or a liberal supply of nourishing but not heating food should be given.

If it is a case of hen-lice, the first thing to be done is to remove the horse from the place infested with these, and then to anoint and wash as before directed.

XIV. Larva in the Skin.

Causes.—The larva, which infests chiefly the back—that part of the horse upon which saddle or harness must press—is not only a source of trouble to the animal, but of great inconvenience to the master, as the acute painfulness of a tumor raised by one of these grubs often prevents use.

The larva is the offspring of a fly which deposits its eggs upon the back and sides of the horse while he is out at pasture or roaming at large upon the common. This fly does not frequent the barn-yard and stable, so that horses which are confined to these when not in use are never annoyed with the larva.

The eggs are hatched by the warmth of the animal; and the creature burrows into the skin, where it remains and grows till Spring, raising meanwhile, by its irritating presence, a small lump, which is eventually developed into a painful tumor, upon the pus of which the insect prolongs a life that it began upon the natural juices of the skin and cellular tissue.

How to know it.—The most unmistakable sign of the trouble, when it is not plainly discernible with the eye, is the restlessness manifested by the horse when subjected to the saddle. When he does this, and no well-defined occasion for his displeasure and his pranks is readily perceptible, examination will reveal a tumor or abscess if the larva is present; for the horse will hardly grow restive at first, when there is a mere lump in the skin. Upon the top of this abscess a black spot will be found, which is the point of entrance, and the opening through which the insect obtains the little air that it needs.

What to do.—The best thing to do, because both quickest and safest, is to open the top of the tumor slightly with a lancet, and then to squeeze out the larva. The wound should then be dressed a time or two

with a solution of one grain of chloride of zinc to one gill of water; and the trouble will soon be over.

XV. Tetter.

Causes.—This seems to arise from some constitutional cause, which it is difficult to point out. It appears on horses of different conditions or habit of body. On some it breaks out periodically, Summer after Summer.

It is not contagious, unless neglected until it assumes the epizootic form, which it sometimes does, after which it is communicable to both man and horse.

There are said by some to be two or three forms of tetter, but in reality whatever different forms it may assume, when not complicated with other affections, they are indications of different degrees of severity.

How to know it.—The attack is usually sudden, and the animal is observed to rub himself severely, as suffering from intense itchiness. The neck, shoulders, back, and thighs are the points ordinarily affected. Upon examination, the skin will be found red with inflammation, sometimes torn or scratched by rubbing; and the blisters or pimples will be seen on those parts of the inflamed spot not so torn or scratched. These blisters break, and a watery fluid is discharged, which keeps the surface moist.

In its more advanced stage it may be taken for mange; but it may be distinguished from mange by its manifesting less tendency to spread and invade all parts of the skin; and by the absence of parasites under the scabby portions.

What to do.—First, see that the horse's bowels are put in good condition. If there is any tendency to plethora, (too great fulness), to constipation, or general feverishness, give him a purgative dose; and in any event let his food be of such character as to prevent costiveness.

Give, once a day, an ounce of Fowler's solution of arsenic. Rub the affected parts well with sweet oil, and let it remain thereon for a few hours; then wash with warm soapsuds so as to remove the scabs or scales. Then cover the diseased surface and some portion of the healthy skin all round with the following ointment:

No. 22.

½ Lb. flour of sulphur,
¼ Lb. carbonate of potash,
1 Oz. carbolic acid,
2 Lbs. lard,
2 Lbs. olive oil.

Mix well with a gentle heat. Allow it to remain on the skin for two or three days, and then wash off with strong soap and water.

Tar ointment, (equal quantities of tar and lard well mixed with gentle heat), is an excellent external application, and may be used when No. 22 is difficult to procure.

XVI. Rat Tails.

Causes.—Simple tetter, as also mallenders and sallenders, is sometimes allowed through neglect to become obstinate; the skin thickens; ugly cracks are formed, from which flows in abundance a sort of purulent half-watery fluid; upon the thickened portion of the skin the scabs increase, growing up into somewhat perpendicular layers, and the hairs growing from these are glued together by the exuding matter. Such bunches of matted hair are called, by reason of their appearance, "rat tails."

The disease seems occasionally to be produced outright, without the supervention of any other known disorder, by much exposure to wet ground of a chalky or loamy nature, or to sticky mud.

How to know it.—It appears chiefly upon the legs, one or all of which may be affected at the same time; but the hairs of the tail, especially near the root of the tail, are often found in the condition described, and for a like reason. Tetter, ringworm, or some other disorder produces itching; the horse rubs the part till it becomes raw; matter exudes at length, and the hair is matted in bunches along the upper portion of the tail bone, as shown in the figure exhibiting external manifestations of disease.

If resulting from either neglected tetter, no matter what its position, or from mallenders and sallenders, it is accompanied by itchiness; but this is generally less severe than is the case with these disorders in their simple form. When the disease is fully developed, the appearance of the bunches of hair upon the parts is a sufficient indication.

What to do.—As in simple tetter, attention must be directed to establishing a good condition of the bowels; and to this end a purgative may be given—especially if there is any indication of constipation and general feverishness. The food must be regulated by the necessity of keeping down all inflammatory symptoms. Make a tonic powder as follows:

No. 23. 12 Oz. sulphur,
1 Dr. arsenic,
1 Oz. bruised coriander seed.

Divide into twelve parts and give one in the food night and morning.

Dress the sores three times a day with the following lotion, applying with a soft rag:

No. 24.
1 Fluid oz. laudanum,
1 Fluid oz. glycerine,
½ Oz. carbonate of soda,
1 Quart water.

XVII. Mallenders and Sallenders.

Causes.—By these terms are denoted oozy, scurfy patches upon the knee and hock—those which appear back of the knee being called (for what reason nobody seems to know) mallenders; and those which appear in front of the hock, sallenders. They spring from idleness and neglect—an impure state of the blood having been brought on by heating and unsuitable diet, and disorders of the bowels, liver, or kidneys.

Though of no serious importance as diseases, they are unsightly, and, if neglected, they result in troublesome sores.

How to know it.—They first begin as a moist tetter, apt to escape observation until they appear in a roughened state of hair about the parts mentioned, under which the skin is scurfy, feverish and somewhat tender. Itching of such severity sometimes attends them as to render the horse restive and hard to keep under restraint.

What to do.—In the first place attend to the cleanliness of the horse and put him upon a regular course of moderate exercise. Give him twice daily, night and morning, a pint of the excellent alterative and tonic drink:

No. 25.
1 Fluid oz. liquor arsenicalis,
1½ Oz. tincture muriate of iron,
1 Qt. water.

Rub the parts affected two or three times a day with an ointment made as follows:

No. 26.
1 Oz. animal glycerine,
2 Drs. mercurial ointment,
2 Drs. powdered ointment,
1 Oz. spermacetti.

If the scurfy places have developed into suppurating sores, use, instead of the ointment, the following lotion, saturating them well twice a day

No. 27.
¼ Pint animal glycerine,
¼ Oz. chloride of zinc,
6 Quarts water.

Be careful that his food is such as to keep him from constipation and fever.

XVIII. Poll-evil.

Causes.—Poll-evil is the name given to a deep abscess having its seat of primary inflammation between the ligament of the neck and the first bone which lies beneath without being attached to it; and it is serious in its nature by reason of this depth and of the difficulty with which the matter formed finds its way to the surface through the strong fibrous membrane that envelopes it. If not attended to in its early stages, the surface of the first bone from the head, or that of the joint between the first two bones, becomes inflamed, and the joint or joints involved.

The disease may be said to owe its origin almost wholly to violence of some kind. A blow upon the poll by a brutal driver may very readily produce it; and much slighter causes, often repeated, result in this affection; as, the forcing on of a tight collar day after day; hanging back and so bruising the poll with bridle or halter; and excessive rubbing of that part because of itch produced by dirt accumulated about the ears and upper point of the neck and not carried away by brush or currycomb. Striking the head against low ceilings and the beams of low doorways is doubtless responsible for very many cases of this dangerous and disagreeable disorder.

How to know it.—A certain restlessness, a throwing back of the head and then returning; again, a drooping tendency, turning the head from one side to the other; a dull appearance about the eyes; a sluggishness of movement—all these are sometimes observed before any symptoms of the disease may be discovered about the head.

Sometimes no notice is taken of its existence until considerable swelling and even an unwholesome discharge have set in; but more frequently an oval tumor is discovered,—hot, tender, situated directly in the region of the nape of the neck, but generally inclining to one side. In the milder form this tumor is evidently superficial; and the horse moves his head with comparative ease and freedom; whereas, in the more advanced stage he carries it stiffly, and every movement of it or the neck causes great pain.

POLL-EVIL DURING THE FIRST STAGE.

Sometimes the disorder is so deeply-seated that the tumor is not developed sufficiently to make much outward show. It is much likelier to discover itself plainly as a well-developed swelling when the hurt is superficial. In any case, it must be examined with the fingers to determine this point. Place the fingers gently upon it, and give the animal time to recover from the little scare into which this touching of a sore at first gives him;

then gradually press upon the part. If the hurt is near the surface, he will flinch quickly; if deeply seated, he will be correspondingly slow in showing evidences of pain. If suppuration has already set in, it can readily be known when near the surface by a sort of fluctuating feeling; but this fluctuation can scarcely be felt at all if the matter is deep seated.

Poll-evil in its Second Stage.

What to do.—If discovered when there is nothing more than a swelling, no matter having yet been found, remove all tendency to general feverishness by giving purgative medicine according to evident fullness of condition; allow the horse to rest; and put him on moderately light diet. Then make the following cooling lotion, and keep the swelling constantly moistened with it by having a small rag pad laid over it and saturated with the mixture from time to time:

No. 28.

2 Oz. tincture of arnica,
1 Dr. iodide of potassium,
1 Qt. vinegar,
1 Qt. camomile infusion.

If this does not reduce the inflammation and remove the swelling within a few days, it may be inferred that matter is already forming, though it may have been impossible at first to detect it; and you must bring it to a head as soon as practicable by poulticing. Use for this purpose a mixture of ground flax seed, corn meal, oil of turpentine, and hog's lard. As soon as matter can be felt, have ready a large and very sharp knife; cast the animal, and have some one to sit upon his neck to prevent struggling; then open with a quick, steady, and strong sweep of the blade through the tumor—being careful to have the wound open at the lower point of the tumor, so as to provide for more easily draining it of matter that may hereafter form. Be careful, too, not to cut the tendinous ligament that runs along the neck under the mane. If the matter appears to be on both sides, open the places separately, so as to leave this ligament undivided. It may, if absolutely necessary, be severed between the second bone and the head, and the support of the head be not materially weakened, since the main stress is on the second bone, and the divided ligament, if healthy, will soon heal again; but it is best to avoid all risks; and if at all convenient, the aid of an experienced veterinary surgeon should be had when it becomes necessary to use the knife.

The wound must now be cleansed by being syringed daily with a stimulating wash, (1-2 dr. chloride of zinc in 1 quart of water), until a healthy discharge sets in, and evidences of healing begin to manifest themselves. Nothing further will then be necessary than to keep the parts clean by daily sponging with warm soapsuds.

It sometimes occurs that before remedial measures are resorted to, not alone the fleshy, but the tendinous, ligamentary, and bony structures have become involved, and the disease has assumed a desperate character. If further neglected, the spinal cord is likely to become diseased, and the case hopeless. If, upon opening a tumor, the matter is found to flow in great quantities, resembling melted glue, with something of an oily consistence, it may be known that the disease is deep-seated and dangerous; and the probe should be employed to find whatever cavities may exist. If any are found, the knife should again be employed, and another cut made, smooth down, and in the same direction as the first, to prevent all rough and hacked walls, till the lowest depths are reached. Then cleanse the wounds with warm soapsuds, using a good gum compress syringe; and dress with a mixture of spirits of turpentine, honey, and tincture of myrrh. When a thick, light-colored matter begins to appear, the dressing must be discontinued, and the parts must be kept clean, as previously directed, by sponging with warm soapsuds.

It is sometimes necessary to cut away loose pieces of ligament till a healthy aspect is presented on the walls and in the depths of the incision.

In the more desperate cases, numerous openings are formed, and these discharge a matter resembling the white of an egg, which adheres to the surrounding parts, and gives to the animal a most repulsive appearance. In this case the knife should be used so as to take in at one sweep the greatest number of openings, and then the other openings should be connected by cuts with this main channel; after which the wound should be cleansed as previously directed, and dressed with the mixture prescribed —spirits of turpentine, honey, and tincture of myrrh.

After matter has formed, the knife is the only sure means of saving the horse; and, in the hands of the skillful man, it is a merciful means. The operation is brief; and the relief is more speedy than can otherwise be obtained. Let no one attempt it, however, who cannot operate as though for the moment divested of feeling, as there must be no hesitation, no awkwardness as to direction, no notching and hacking.

A horse that has once had the poll-evil should never afterward have a collar thrust over his head, or be hauled around with a halter or any other head-gear pressing upon the part. The poll will long remain tender, and a return of the disorder is likely.

If it is necessary to treat during Summer, when the horse is apt to be

annoyed with flies, keep the wound covered with a rag moistened in a solution of tar.

XIX. Fistula.

Causes.—This is sometimes known as *fistulous withers*, to distinguish it from fistula of the parotid duct. It is similar to poll-evil and is generally caused in like manner, by bruises. In the case of fistula, these bruises may be caused by an ill-fitting collar; by a lady's saddle, particularly if awkwardly ridden; by the pressing forward of a man's saddle, especially in case of high withers; by striking the withers against the top of a low door-way; by rolling and striking the withers against some hard substance; by the biting of other horses; and by a blow of the blacksmith's hammer. The points of the spinal processes, (little projections of the spine or back bone,) are hurt, inflammation sets in, and the fistulous tumor is produced. Its site is the spine above the shoulders; and it is more troublesome than poll-evil, because it is more exposed to repeated injuries.

How to know it.—The first indication will be a swelling on one or both sides of the withers, generally rather broad and flat. Upon examination with the fingers this will be found hot, tender, and apparently deep seated. If observed when first formed, it will be of uniform hardness throughout. If unattended to while in this state, the tumor soon becomes an abscess; and owing to the difficulty in the way of the matter's escaping, (its natural outlet being at the top of the shoulders), the pus sinks downward; and the abscess sometimes becomes enormous before there is any well defined head, and before there is any opening. When it breaks, or is opened, a large quantity of extremely offensive matter flows out. Ordinarily, the tumor will come to a head in from one to two weeks. When the discharge has begun, the tumor does not begin to grow healthy and heal, but the walls of the opening thicken, and continue to discharge matter which becomes more and more offensive. The matter burrows between the shoulder blade and spinal points, and everything around seems to be rotting away; and it is both difficult and dangerous to trace the opening. In process of time several holes will appear along the course of the muscles in contact with the original abscess, and from each issues a foul discharge, till the ulcerating process seems to extend itself to nearly all the muscles of the shoulder.

The health of the animal may at first be excellent, and there may be no lameness; but as the inflammation extends, there is lameness of the shoulder, and he suffers generally—often greatly. He is averse to motion, and will suffer for food and drink rather than undergo the pain

of trying to reach and partake of it. In its worst stages the bones extending into the sinus decay.

SLIGHT ENLARGEMENT WHICH MAY END IN FISTULOUS WITHERS.

FISTULOUS WITHERS—WORST STAGE.

What to do.—Be careful to ascertain, in the first place, whether the tumor has newly risen. The matter may form in one, even while it is quite small; and it is important to know when the knife may be used to advantage.

If matter has already formed, it can be detected by the somewhat soft and fluctuating feeling of the abscess.

If discovered while still a new formation, take the horse from work, if possible; if not, take especial pains to protect the injured point or points from pressure. A bruise at that point of the withers where the collar rests will not unfit a horse for the saddle, unless considerable inflammation and extending soreness has already set in; nor will a saddle bruise, farther back on the withers, necessarily unfit him for harness.

A recent swelling should be immediately treated with fomentations of bitter herbs.

Boil wormwood, or mullen stalks, or life-everlasting in soft water, to make a strong decoction; and apply it with large woolen cloths, as hot as can be borne, to hasten the formation of matter. When the tumor begins to soften and show signs of heading, have a suitable, fine-pointed, sharp knife. Ascertain the lowest point of the abscess. Then stand close to his side, near the middle, to avoid both hind and fore feet in case of kicking or striking, with the back of the knife to the shoulder; point upward and outward, stick at the lower edge, and cut open with a free incision. Next, syringe the abscess till it is as thoroughly cleansed as possible with a solution of carbolic acid and water, one part acid to two of water. Then dress with coal oil, or some convenient salve. After two or three days, the wound should be thoroughly cleansed by syringing with warm soap suds; then use the carbolic acid water, and repeat the oil or salve dressing; and so on till a cure is effected.

The patient must in no case be turned to pasture, since the constant motion of the neck and jaws necessary to procuring and masticating his food aggravates every symptom. Stable him comfortably, and feed

according to his general condition. Let him have water freely; and give opportunity each day for some exercise by allowing him the run of a small inclosure.

When the case has become chronic, and holes in considerable number have appeared, make a cut so as to reach the bones, and to include in its course as many holes as practicable. If there are other openings, (particularly below), cut from them into the main incision. Have an assistant to press back the sides of the greater opening till the matter is cleared out; and if the spinous processes or points are found to be carious or rotten, nip off with a pair of bone forceps till the healthy bone is reached. If any of this decaying bone is left, the wound will inevitably matter and break again, though it may for a time appear to have healed.

After thus cleaning out the bulk of the matter and picking away the dead bone, use the syringe and warm soap-suds still further to clean the parts; then inject the carbolic solution as previously directed. But instead of coal oil, use this ointment once a day;

No. 29.
½ Oz. verdigris,
½ Oz. copperas,
1 Oz. oil of turpentine,
4 Oz. yellow rosin.

The copperas and rosin must be finely powdered—then mix all together thoroughly. When a kind of thick whitish discharge is observed to have set in, discontinue the ointment; but still wash or syringe thoroughly, at intervals, with warm soap-suds. To keep away flies, cover the wound, after each dressing, with a large cloth saturated with diluted tar.

Should the horse grow feverish from the effects of blood poisoning, which takes place in a greater or less degree in this chronic stage by reason of absorption, bleed him once, at least, taking from the neck vein from three to six quarts, according to general condition and severity of the inflammation.

When the disease has proceeded to the length of requiring this severe treatment, the recovery is necessarily slow, and the horse is inevitably disfigured.

In very desperate cases it is sometimes best, or, indeed, almost indispensable, to use the rowel. The pipes, (or sinuses as they are sometimes called), the openings whence the matter exudes, take a dangerous direction, and tend from the withers to the chest. Use an elastic probe, to ascertain the direction and the depth; and if it is found that cutting will not answer, use the *guarded* seton or rowel needle described in the chapter on medicines, ointments, etc. Insert it as far as it will go, then give it a firm rap on the handle, so as to force out the cutting edge and drive the point through the flesh. Knot one end of a long, slender tape,

place the other through the opening near the point of the needle and draw it through. Then tie a knot at the other end, and leave it. In this way, the sinus will have an opening below, and the tape will act as a drain, while tending also by friction to remove the hard lining of the pipe. As soon as a healthy looking matter is seen to be issuing from the lower orifice, remove the seton, but cleanse occasionally with warm soap and water.

CHAPTER III.

DISEASES OF THE GLANDS AND NASAL MEMBRANES.

I. GLANDERS.—II. FARCY.—III. DISTEMPER.—IV. NASAL GLEET.—V. NASAL POLYPUS.

I. Glanders.

Causes.—This seems to be primarily a disease of the lymphatic and nasal glands, and confined to them; but upon this point authorities disagree, and it is contended by some that all the air passages are always affected—that it is a kind of phthisic, or incipient pulmonary disorder—and that whether the ulcers appear on the membrane of the nose prior or subsequent to the formation of tubercles in the lungs does not invalidate the proposition that the earliest external manifestations are but the effects of pulmonary derangement. The most tenable conclusion, however, is plainly this: that inflammation of the membrane of the nose, and confined to that membrane, at last results in ulceration; that the matter discharged from these is poisonous, and acts upon the glands by means of the absorbents with which it comes in contact, and is also inhaled into the lungs with the air as it passes through the nasal cavities, till at length both the circulatory and the respiratory systems are generally diseased.

Whence this poison is derived is not at all clearly defined. The disease is both spontaneous, (bred in the horse), and contagious; but it is doubtless due far more frequently to predisposing cause than to contagion. It is found as a prevalent disease where neglect, filth, and foul atmospheres exist; and we may reasonably conclude that poisonous inhalations, acting upon the delicate and easily irritated membrane of the nose, produce that incipient ulceration from which the subsequent general poisoning proceeds. In close stalls, the carbonic acid given off from the lungs, (which gas is of a deadly poisonous character), passes again and again

into the lungs, mixed with other impurities of the stall itself; this, acting perhaps more readily upon the nasal membrane than upon the other linings of the air passages, produces inflammation. This inflammation may long exist, and unsuspected by the ordinary observer, till some intense action is set up, when ulceration takes place.

Or it may be produced by anything that injures and weakens the vital energy of this membrane; as violent catarrh, accompanied by long continued discharge from the nostrils; a fracture of the bones of the nose; and the too frequent injection of stimulating and acid substances up the nostrils. Everything that weakens the constitution, may, under peculiar circumstances, produce glanders. Among the hurtful influences that may operate to this end we may enumerate: hardships and an exhausted constitution; any interference with the due elimination or throwing off of morbid and waste matter from the system; want of regular exercise; sudden and violent exercise when the horse has not been previously prepared for it; placing a weak and worn-out horse upon a course of diet that is too nutritious and stimulating; and hereditary predisposition to certain forms of disease.

One point is deserving of special mention: it is sometimes present and contagious in animals apparently in fine bodily condition; other horses may contract the disease from such a one and die of it while it is still difficult to discover unmistakable traces of it in the first. There may be inflammation, and minute ulcers so far up the nasal passages as not to be seen; these little hidden ulcers may discharge so small a quantity of matter as to escape notice, and yet the matter is so poisonous that when it comes in contact with any thin and delicate membrane, by which it may be absorbed, it will produce glanders. Weeks, and even months, may intervene between the first existence of inflamed membrane and the development of the disease. In this case there may be counteracting tendencies, requiring some violent action or sudden change to determine the issue.

It must be observed that its infectious nature is not general, but particular — depending upon inoculation with the matter exuded from glanderous ulcers, or at least from poison received in some way from the glandered animal and communicated directly to a wound or to some delicate membrane of another horse, an ass, or a human being.

How to know it.—As may be inferred from the preceding, it is not always easy to detect the actual presence of this disease, though it is often a matter of paramount importance that it should be known. Its dangerous character as an infectious disorder makes it essential that it should be known in its very earliest stages, that the proper precautions may be taken to prevent the infection from spreading.

There are some symptoms that may be observed, even before the appearance of any discharge whatever; and these may be described, though they may sometimes prove fallacious, and are found to be but extraordinary indications of some other disease.

The first signs are those of heaviness, dullness, followed by fever; the eyes are red and unhealthy looking, while the light is seemingly painful to them. The hair is one day dry, the next, perhaps, it resumes its natural appearance, and so alternating until after awhile it becomes staring and unnatural. The flesh wastes away rapidly for a time; then, and particularly if a change of food is introduced, showing some improvement, and so alternating till at length he begins to show signs of permanently failing health and of a general debility.

These may be regarded as for the most part premonitory signs, and up to this time there may be no appearance of tumors and no discharge from the nostrils; but the animal should be subjected to the most rigid scrutiny, to discover whether there is anything to confirm the impression made by the symptoms enumerated as to the probable existence of glandered condition.

After these manifestations there may be said to be three stages of the disease, the peculiarities of each of which, in so far as they are distinctly defined, are generally as follows: In the first stage the discharge so much resembles that which attends some other nasal affection as sometimes to pass unnoticed, but examination will disclose a curious fact which has not been accounted for,—it will be found confined to one nostril, and that, in the vast majority of cases, the left. Occasionally it is the right, very seldom both. This, however, must not be regarded as a peculiarity of the first only, as it is common to every stage of the disease.

The second stage is characterized by an increased flow, and it also becomes more mucous and sticky, while its color changes from an almost transparent clearness to a whitish or yellowish tinge. It often begins now to drip from the nose in stringy clots. Some of the matter in this stage, now more actively poisonous, being taken up by the absorbents, affects the neighboring glands. If both nostrils are discharging, the glands within the under jaw will be enlarged on both sides; if from one nostril, only the gland on that side. As other diseases will produce these swelled glands, as catarrh, for instance, it becomes necessary to look for some peculiarity in order to determine certainly as to the existence of glanders. At first the enlargement may be spread over so much surface as not to make any distinctly marked lumps; but this soon changes, and one or two small swellings remain, and these are not in the center of the channel, but adhere close to the jaw on the affected side.

This may be regarded as an almost conclusive test. The membrane of the nose will now be found of either a dark purplish hue or a leaden color—the latter, unless there is some of the redness of inflammation; and ulcers will probably appear upon the membrane, usually approaching to a circular form, and deep, with abrupt and prominent edges. When these appear there can be no further doubt, but care must be taken to know that they are not spots of mucous. To this end, try whether they may be brushed away. Notice particularly, too, that the orifice of the duct which connects with the tear glands is just within the nostril, and on the inner side of it; otherwise, this, if foul, may be mistaken for an ulcer. This orifice may be readily distinguished from an ulcer by observing that it is on the continuation of the common skin, while the glanderous ulcers are on the membrane of the nose.

When these ulcers begin to be visible, the general condition of the animal soon shows signs of change; his coat seems dead and staring, the hair coming off easily; his appetite is impaired; he loses flesh; his belly contracts; he grows more and more debilitated; there is more or less cough; the discharge increases in quantity, and its increased poisonous character causes it to remove the hair where it flows, while it seems tinged with blood, and is offensive to the smell.

In the third stage the ulcers have become larger and more numerous; and upon placing the ear to the horse's chest, a grating, choking noise will be heard at every act of breathing. The air passages being obstructed, every breath is drawn with difficulty. The skin of the forehead will be found somewhat thickened, swelled, and peculiarly tender; the membrane lining the frontal openings of the nose will be not only ulcerated but evidently inflamed; the discharges are increased and become more sticky and of darker color, though still somewhat flecked with blood. The absorbents become more and more involved; it seems now that general ulceration has set in; and the additional symptoms are henceforth those of farcy.

To prevent its being mistaken in its earlier stages for strangles, which is sometimes done, the following directions will suffice:

Strangles is peculiar to young horses, and at the outset resembles cold with some fever and sore throat, accompanied generally by distressing cough and some wheezing. The enlargement which sometimes appears beneath the jaw in strangles is not a single small gland, but a swelling of the whole substance between the jaws, growing harder toward the center, and at length, if the disease runs on, breaking. In strangles the membranes of the nose will be very red, and the discharge from the nostrils profuse and mattery almost from the first. When the tumor has burst, the fever will abate and the horse will speedily get well.

To distinguish it from catarrh, for which also it is sometimes mistaken, observe that fever, loss of appetite, coughing, and sore throat all accompany catarrh, whereas these symptoms are rarely if ever found together in glanders. In catarrh, the horse quids his food, (drops it from his mouth partially chewed), and gulps his water. The discharge from the nose is profuse and sometimes mattery; the glands under the jaw, if swollen, are movable, while there is a thickening around them and they are hot and tender.

What to do.—The first thing to do, and in the first stage, will naturally suggest itself to any one who has taken the pains to inform himself of the dreadful nature of the disease. Its contagious character renders it dangerous, as has been said, not only to all of the horse kind but to man; and no time should be lost in removing a glandered animal from the possibility of communicating the disorder to another. If stabled, there should be no connection whatever between his stall and those of other animals, as the discharge from the nostril, (in which lies the danger), may be communicated through any opening sufficient to allow horses to bite or nibble at each other. If placed to pasture, it should be known that no other horse is at all likely either to be turned in with him or to approach the inclosure. And this removal or separation should take place whenever it is observed that there is that constant discharge from one nostril which has been described, even though it may seem but watery and natural, and the horse be in the very best apparent condition. Remember that a glandered condition may long exist, and minute ulcers, in the hidden recesses of the nose, discharge a sort of limpid or clear fluid, without any of the active and violent symptoms being manifest; but that all this time the horse may be able to communicate the disease to others; and that these may die of it while he is yet in reasonably fair condition.

It can hardly escape the intelligent horse owner that every known cause of the disease should, if possible, be promptly removed. Close, damp, dark stables, reeking with exhalations distilled from mingled dung, urine, and rain water, ought at any rate to begin to receive a little attention after the poor occupant has caught what is more than likely to prove his death; if he is jaded and exhausted by labor, no hope of cure can be entertained unless he is promptly released from his toils and put upon moderate and health-giving exercise only, with such generous diet as will restore the wasted tissues; if, on the contrary, he is pampered and stimulated and grown unwholesomely plethoric for want of labor proportioned to his good keeping, his food should be gradually changed, and a regular course of moderately increasing exercise be instituted and

persevered in till that point is discovered at which such exercise is recuperative rather than exhaustive, and then maintained.

It may be well, before proceeding farther, to caution the reader against the advice of quacks, and point out what *not* to do. This may be summed up in the one single injunction, *do nothing cruel*. All such practices as slitting the nose, scraping the cartilage, searing the glands, firing the frontal and nasal bones, and injecting mustard, capsicum, vitriol, and corrosive sublimate up the nostrils, are but the hurtful devices of ignorance combined with brutality.

If the disease is in its first stage when the horse is taken in hand for the purpose of employing remedial agencies, place him in a good, dry and airy stable, if in Summer, or in an open pasture where most of his food may be obtained by himself, observing the precautions already laid down. If in Winter, he should still have the dry stable, not too close, and supplied with clean litter, and care should be taken to guard him against severe cold and exposure to any sudden change. The matter of food may be regulated by this: it must be nutritious without being inflammatory; and the condition of the animal as to previous treatment and present condition of flesh must regulate the quantity, as also to some extent the quality. Then prepare and administer the following medicine:

No. 30. 1 Drachm powdered sulphate of camphor,
4 Fluid drachms Fowler's solution of arsenic.

Mix with linseed meal and syrup to form a ball, and give one of like quantity each day for three days; then omit a day; then give the balls for three days again, and so on till a change for the better is perceptible or its failure is manifest. Meanwhile, swab out the nose every day with a solution of pyroligenous acid—using warm water, (as warm as the horse can well bear), and putting in sufficient of the acid at first to make the solution of medium strength. It should be a little increased from day to day; but care must be taken not to make it too strong, as violent acid injections or swabbing solutions are calculated to do harm rather than good. A good mop for this purpose may be made by attaching soft rags, (old cotton cloth is best), to a light stick, two feet in length—so arranging the cloth as to have it project beyond the end of the stick to be inserted, to prevent any roughness that might abrade or scratch the membrane, and fastening very securely, to prevent its slipping off.

If this treatment is found not to be efficacious, or if the disease has already developed into the second stage—the discharge more mucous, sticky, and stringy, with glands swollen and the membrane of the nose of a dark purple or leaden color—adopt the following treatment, and carry it out energetically and persistently:

Take from the neck vein from three to six quarts of blood, according as the horse may appear feeble or plethoric. Make a gallon of very strong decoction or tea of tobacco leaves, which keep ready for use. Put enough of this into warm water, (as warm as the horse can well bear), and swab out his nostrils with it, as high up as possible, using mop as just directed. Then put a gill of this same strong tobacco tea into a pint of warm water, and drench him with the solution. There must be no uneasiness on account of the dreadful sickness which this will produce. The tobacco is necessary thoroughly to relax the system and overcome fixed or chronic tendencies, and to counteract the influence of the glanderous poison. Swab out the nose every day for eight or ten days, and drench every third day for from two to four weeks, or until the discharge has ceased and the ulcers are perceptibly healing.

So for the first two stages. If all these directions, (those as to food and care as well as for the administering of medicines), are faithfully carried out, a reasonable hope of success may be entertained. If the disease has passed into the third stage, however, no treatment can be confidently recommended. So doubtful is it as to whether any remedial agencies will avail, that most veterinarians in the United States confidently declare that the best thing to do is to kill the sufferer in the quickest and most humane way, and bury him deep in the ground, beyond the possibility of his contaminating the atmosphere with his decaying and poisonous carcass. This is made a matter of legislative enactment in England—severe penalties attaching to the keeping of glandered horses—and it is contended by some that the general safety of both animals and man require like legal enactments in this country; but, as we have said, until he has passed into the third state, or where he seems to be suffering with both glanders and farcy, a good horse ought not to be sacrificed. It cannot be too strongly urged, however, that no effort ought to be spared to prevent the spread of the contagion; and the man who would expose a horse for sale, known to him to be glandered, but not apparent to a casual observer, ought to be confined in the State prison.

A horse affected with this disease, in any stage, is dangerous to the man who handles him; but he is doubly so, perhaps, when he has become a loathsome object in limbs and body as well as in head; and under ordinary circumstances it is doubtless best to destroy him as quickly as possible. In case treatment is determined upon, nothing better than that prescribed for the second stage can be recommended.

The reader's attention ought to be called to this fact: that there have been instances of a spontaneous cure of glanders—that is, of cures having taken place without the agency of remedial means used by man;

but all such cases may have been apparent rather than real—a mere suspension of the active powers of the poison—and they ought to be looked upon with suspicion. These may be resumed at some future time and with fatal result.

It remains now but to suggest some precautionary measures to prevent contagion, in addition to those which have already been given. If a stable is known to have been used by a glandered horse, no other animal should be allowed to occupy it until the trough, the rack, and the walls have been thoroughly scraped and scoured with strong soap and warm water. Then take one pint of chloride of lime and dissolve it in two gallons of water, with which thoroughly saturate every part that the horse's nose may have touched. Next, white-wash the walls inside. Then burn bridles, halters, buckets out of which he has drunk—whatever may have been about his head—and if any blanketing has been used have it carefully cleansed by washing, or burn it up.

II. Farcy.

Causes.—In treating of glanders and farcy there is a great diversity of opinion as to the relations in which they stand to each other—which is the antecedent, which the consequent; but the most sensible view of the matter, and the one taken by the ablest veterinarians, is this: that the two are but different manifestions of the same disease, and that they might with propriety be so treated. Regarding them separately it is difficult to say which is the more acute form, which the more chronic, as it is now generally conceded that a horse afflicted with what may seem at first a well-developed case of glanders may be presently laboring under confirmed farcy—the last state apparently worse than the first; again, a case of farcy may assume the type to which the name glanders is applied, and in this case also there seems to be a development of the first into a more hopeless disorder.

This would be a matter, however, of no special consequence to the intelligent horse owner were it not that the confused notions of men concerning the two affections might chance to bring him face to face with this difficulty: that, unable to eliminate the truth from the tangled statements of some who, entertaining diverse views, may take it upon themselves to advise, he may find himself halting between two opinions when it is of vital consequence that he should be doing something. Let him be assured that it is wholly unnecessary to trouble himself with nice questions as to the priority of either disease or the real difference between them; the one important point for him is to be able to detect in the incipiency of an attack of either that *one of them* is present.

Speaking now of the farcy as a distinct disease, it is to be regarded as a general poisoned condition of the horse—the poison having its immediate origin in an ulcerated condition of the lymphatic glands; and its remote origin in whatever tends to disorder these lymphatics. The remote causes are often found in constitutional or inherited tendencies, but more frequently, no doubt, in neglect and abuse—some of the forms which these take on being overwork and under-feeding; lack of the curry-comb and brush; exposure to the foul atmosphere of dark, damp stables, and their accumulations of filth.

The glands so affected are more numerous along the jaws, neck, and flanks than elsewhere near the skin. Some species of poison is taken into the system of the animal, which manifests itself by an enlargement of some of these glands into the hard, rounded lumps, called *farcy-buds*, or *buttons*, which presently secrete and discharge dangerous infectious matter. The absorbents whose office it is to remove useless particles from the body, take up from beneath the skin some of this virus; they inflame with it and swell; and by their connection with the veins give the latter a corded, swollen appearance. The poison, of course, finally reaches the veins and is mingled with the blood; by the blood it is conveyed to every part of the system. Acting upon the valves of the veins—those little membranous sacs which assist in giving the blood a uniform tendency towards the heart—the poison creates new knots or buttons, and thus they increase until many portions of the skin are covered with putrid ulcers

The first existence of an ulcerous condition may not be upon any visible portion of the body. Minute poisonous ulcerations may arise in the recesses of the nose, and discharge so slightly as to escape observation until the general system is thoroughly inoculated with the virus.

It is, however, extremely capricious in its manifestations; probably owing more to the peculiarities of different animals than to any difference as to either immediate or remote causes of the disease itself. It occasionally takes on a lingering form, and will continue for months and years; again it will run its course and kill the horse in an incredibly short time.

It is extremely contagious in all its stages, and is communicable not only to other brutes, but to man.

How to know it.—It is difficult to give in few words such directions as enable the unprofessional and inexperienced reader readily to detect this disease in its incipiency, and to distinguish, in its somewhat advanced state, between it and some other diseases which have, occasionally similar manifestations. It often perplexes by the different forms it assumes; but close attention to the following particulars and a wide-awake interest,

that leads one to observe changes and peculiar conditions will probably suffice:

In some cases the horse will droop for many days before the appearance of either buds or corded veins; the appetite is impaired; the coat is staring, or rough and unpleasant to the sight; his mouth is hot; his thirst great and difficult to quench; the urine is highly colored; the hair comes off easily; and he evinces then the symptoms of a generally deranged condition.

Sometimes the horse will appear to be perfectly well at night, and next morning one leg, usually the hind leg, will be fearfully swollen, hot with fever, and almost without the power of moving.

At other times the head will swell, the muzzle, particularly, will be enlarged, and an offensive discharge proceed from the nose.

Again, this tendency to the swelling of the leg is accompanied by cracks at the heels, leading the inexperienced to mistake it for ordinary "swelled legs" or for "grease."

When taken by inoculation, (the poison having been received from another animal or from trough, stable, or curry-comb), it is apt to manifest itself in its earliest stages by shivering, followed by heat of body, a frequent and hard pulse, dullness, accelerated breathing, and rapid elevation of temperature. These attacks may speedily prove fatal.

In all these cases, the poison has been working, but is not yet outwardly manifest. Generally the first stage of unmistakable local manifestation is a swelling of the lymphatics, a development of the "farcy-bud." A single bud will sometimes appear near the pastern joint and run up in an uneven knotty form. They usually appear, however, along the sides of the neck or inside the legs, and are rounded, with an elevated edge, and a pale surface. These presently burst and discharge a watery fluid for some time, when a change takes place and the discharges become more mattery and offensive, and are mixed with blood. They frequently increase in number until the neck, shoulders, and legs are almost entirely covered with them—sometimes almost the whole body becomes a putrid loathsome mass. In this last case there are no longer any buds or knots, as the veins have become so generally injured as not to show special prominences at the valvular points.

Occasionally it will be found that the buds will not ulcerate, but become hard and difficult to remove. This indicates that the progress of the disease is suspended; but the poison is in the system, and if steps are not taken at once to eradicate the seeds of the malady, it will in time break out and destroy the horse.

When it rises along the spine, as it occasionally does, it is to be considered malignant and very dangerous, particularly to those horses

that are fat and full-blooded—the disease in this case being most probably the result of infection.

To enable one to distinguish it from those diseases for which it is sometimes mistaken, the following directions, if closely observed, will be sufficient:

It differs from surfeit in this: that the buds are generally higher than the surfeit tumors, more knotty, not so broad, and are found principally on the inside of the limb and not on the outside.

The sudden swellings of the legs, head, or chest are characterized by heat and tenderness that do not accompany other enlargements; and the farcy may be distinguished from grease or swelled legs by this: that in grease there is usually a peculiar tightness, glossiness, and redness of the skin, with scurfiness, discharging cracks, and a singular spasmodic catching up of the leg. In farcy the swelling is more sudden—the leg that is apparently sound at night is found in the morning swollen to an enormous size. It is owing to a simultaneous inflammation of all the absorbents of the limb; but instead of the redness and glossiness of surfeit there will be burning heat without outward manifestation, and the leg will be peculiarly tender, while the body will be generally feverish.

It may be known from that local dropsy of the cellular membrane producing an enlargement beneath the thorax called water-farcy, by simply observing that in water-farcy there is general weakness unaccompanied by inflammation.

What to do.—The treatment must of course be directed primarily to the removal of the blood poison and to the restoring of the assimilative powers of the digestive and circulating organs. It must be both general and local; as the vital functions are to be restored to their normal condition at the same time as the outward manifestations of the poison are removed. The buds must be dispersed and the ulcers healed by active external applications, since the powerful internal remedies must be more or less inoperative while these receptacles of poisonous matter furnish a constant supply to the absorbents, to be carried by the various organs of circulation to all parts of the body.

The first and most necessary thing to do is to exercise a wise discrimination *as to the stage of the disease*. If found to be in its incipiency—few buds having appeared, and being slow to spread; no foul discharge from the nose; no sudden swellings and violent heat—the following treatment may be adopted with every hope of success:

Pay particular attention to feeding, and to keeping the stable, (if necessary to have the animal confined), clean, dry, and comfortable. The food should be easy of digestion, but nourishing, and especially of such

a character as to keep the bowels regular. Bran, oats, long forage, (green if possible), are good; and an occasional mash of boiled carrots or turnips mixed with bran or shorts, to which a table-spoonful of salt is added, will be found beneficial. He should have moderate daily exercise; and as much good pure water as he will take should be given him. If the food given does not have the effect of keeping the bowels open, give an occasional mild purgative compounded as follows:

No. 31. 3 Drachms finely powdered aloes,
1 Drachm ground ginger.

Stir these ingredients thoroughly together; then use sufficient soft soap to make a paste that can be rolled into a ball. Wrap this in thin paper, and give by elevating his head and thrusting it into his throat.

Give the following tonic, to stimulate the digestive and secretive functions:

No. 32. 6 Oz. powdered sulphate of iron,
6 Oz. rosin,
3 Oz. gentian,
3 Oz. ground ginger.

Mix thoroughly, divide into twelve powders, and give one night and morning. When these powders are exhausted, make up the same mixture, with the exception of the rosin, which, by too long continuance is apt to affect the kidneys unduly, and give as before, night and morning.

To remove the buttons and ulcers, take a large stick or pencil of lunar caustic or of caustic potash, and with it burn out the central portion of each bud, and cauterize each ulcer. When convenient to obtain what is called a farrier's "budding iron," the work may be more expeditiously done by heating the iron to redness, and, after rubbing it on something to clear off the scales, inserting the point into every bud and ulcer—remembering that it must be done moderately, and not so as to destroy the tissues. When these burnt places begin to slough out, and look pale, foul, and spongy, with thin matter, wash them frequently with a solution of 1 drachm of corrosive sublimate in 1 oz. rectified spirits. When the wounds begin to look red, and the bottom of them is even and firm, while they discharge a thick white or yellow matter, use some simple ointment.

If the disease is plainly in an advanced stage—the buttons and ulcers numerous and widely spread over the body; the thirst great and hard to satisfy; signs of glanderous ulcers on the mucous membrane of the nose; the hair, where the sores have not invaded the skin, staring and easy to

come off; the general appearance filthy and loathsome—the following severe treatment should be adopted and perseveringly carried out:

In the first place, observe all the precautions as to diet and the state of the bowels previously recommended, being careful to guard against extensive purging, for this will tend rather to reduce the disease to a lower stage, and to retard recovery.

Bleed at once, taking from two to four quarts of blood from the neck vein, according as the body is more or less inflamed.

Take a gill of very strong solution of tobacco and pour it into a pint of warm water, and drench with it. Repeat this dose every third day until a change for the better has evidently taken place. If the feverish state continues he should be bled again, taking a like quantity as at first, within a week or ten days. The practice of bleeding, as insisted upon by some veterinarians, cannot be recommended; but there are cases in which it may be employed with the greatest advantage. In farcy, it cannot be said to remove the poison to any great extent, though it does in some measure have this effect; but the vitiated condition of the fluid seems to render it turgid and slow, and to produce an unnatural distension of the veins and capillaries, which bleeding partially relieves—possibly by both diminishing the quantity a little and by a reaction which follows the shock given to the organs of circulation by the act of blood-letting.

The tobacco drench is a powerful medicine in counteracting the poison in the system; and while the dose recommended will make the horse very sick, from its well-known nauseating properties, its effects are not to be feared.

On those days which intervene between the doses of tobacco tea, the tonic powder, No. 32, may be given as directed for the milder stage of farcy, omitting the rosin.

When the poison has been long at work without betraying its presence, till all at once the horse becomes lame, his legs swell, violent general heat sets in, large and vicious looking buds appear suddenly and presently break, while a stinking discharge takes place from the nose—corded veins and buttons appearing in some instances along the spine—the case may well be looked upon as hopeless; and if there are other animals that are in danger of taking the affection from him, it is doubtless best, as is generally recommended by English veterinarians, for even much milder forms, to kill the horse and bury him beyond the reach of all danger to others. In this stage of the disease he is dangerous to man, and no one ought to be required to take the risk of handling him.

Lastly, every precaution should be taken to guard against the spread of the contagion. When a horse is known to be affected with farcy, no

time should be lost in cleansing the stable where he has been confined—washing the trough, rack and walls thoroughly,—saturating them after that with a strong solution of chloride of lime, (one pint of chloride to two gallons of water), and then white-washing the walls inside. Curry-comb, blanket—whatever may have the poison adhering to it—had better be burned.

III. Distemper

Causes.—This is an epidemic disease, occurring in young horses, generally, and when it once breaks out all the animals in the stable are likely to be infected with it, unless they have already had it. Colts and young horses will take it from older ones more easily than older ones from the young.

If it is not actually generated by filth and uncleanness in the stables, the disease is certainly aggravated by causes producing miasma and bad air in the stables. Therefore cleanliness is essential not only as a means of preventing the disease, but in rendering it of a mild type when it breaks out

Horses will contract the disease from others when at a considerable distance. It is supposed to be communicated both by actual contact and also from germs proceeding from the breath. Hence when once it breaks out, at the first symptoms, isolate the sick animal or animals, fumigate the stable thoroughly and daily.

To do this fill the stable with tobacco smoke, both the stable from whence the sick horses have been taken, and the place where they are confined during treatment. Let the smoke be so thick as to become quite inconvenient. Make all the animals inhale as much as possible. Wash every part of the stable, and especially the feeding places and hay racks, with a strong decoction of tobacco stems, using for the purpose cheap, rank tobacco. Keep powdered tobacco leaves in the mangers of all the horses. This being early attended to its spread may be generally arrested.

How to know it.—The disease has three stages. In the early stage of the disease there is a dry, hacking cough, and there will be noticed a discharge from the nose, first of a thin, watery fluid succeeded by a thicker, purulent discharge of a whitish color.

The next stage of the disease shows itself in a swelling of the throat. The salivary glands, which at first were inflamed, are now closed, and pus is being formed. At length an abscess is formed.

The third stage is the suppurative stage, in which the abscess breaks;

sometimes there are two. From this time on, the animal is in a fair way to mend, and every means should be taken to promote the discharge. In bad cases the suppuration may continue for weeks, and in extreme cases it may continue for months.

From first to last there is a fever. The pulse is quickened and hard. The appetite fails, both from the fever and inability to swallow. As the fever increases the eyes become dull and glassy; the hair is dry, will not lie close, looks dead; and the animal stands with its head drooped, and the whole appearance is stupid.

What to do.—In some cases, bleeding will be indicated. This, however, should not be allowed except under the advice of a competent veterinary surgeon or physician. If the animal is fat, or if there are indications of blood poisoning, from a quart to three pints of blood may be taken from the neck vein. The animal must be warmly clothed and kept in a thoroughly well ventilated but comfortable stable. Let the food be light, but nourishing. Mashes made of oat-meal and bran; also boiled oats; oat-meal gruel, and hay-tea should be given for drink. Give the following:

No. 33.
1 table-spoonful pulverized gum myrrh,
1 table-spoonful gun powder,
1 table-spoonful lard,
1 table-spoonful soft-soap,
2 table-spoonfuls tar.

Mix, and put a spoonful of this mixture on a long, narrow paddle down the throat twice a day, so it will lodge about the glands of the throat.

Let all drink and food have the chill taken off before giving it. If there is considerable fever and the tongue is coated, give a little cream of tartar in the drink. If the limbs are cold, bandage them and hand rub to promote circulation. Give once a day in the food the following:

No. 34.
2 or three ounces flower of sulphur,
1 ounce resin.

To be mixed in the food if it will eat, or in the drink. Give also three ounces of sulphur per day, if the animal will take it. Wash the neck two or three times a day with a decoction of tobacco as hot as the animal will bear it. If these remedies are taken in time and faithfully applied, they will often prevent any tumor from forming. If the tumor forms, then every means must be employed to cause it to suppurate. It will then be dangerous to scatter it. If the bowels are obstructed, remove the contents of the rectum by the following injection:

No. 35. 4 Drachms powdered aloes.
1 Drachm common salt,
2 Drachms hot water.
Mix, and inject when blood-warm.

Use every possible means to promote the formation of pus and its discharge. Common distemper and strangles are similar in some of their symptoms, and one may run in the other. Stimulate the swelling with the following:

No. 36. Two parts spirits of turpentine,
One part laudanum,
One part spirits of camphor.

EIGHT-TAILED BANDAGE.

Apply this three times a day with a brush until soreness is produced. After each application keep the parts warm with folds of flannel, kept in place with an eight-tailed bandage, a piece of flannel having three slits cut in the ends for tying, and long enough to go round the throat and tie over the top of the head.

If this does not cause the tumor to form, prepare a poultice as follows:

No. 37. 1 Part powdered slippery elm,
1 Part poplar bark,
1 Part ground flax seed.

Moisten with vinegar and water equal parts, quilt between two folds of cloth and apply to as large a surface as possible. When the tumor has formed pus and is nearly ripe, which may be known by a soft place where it is working its way to the surface, open it with a knife with a round-pointed blade, and if necessary increase the opening with a button-pointed bistoury, to allow free exit of matter. It will give almost immediate relief. Then apply to the swollen glands night and morning, the following:

No. 38. 4 Ounces spirits of camphor,
3 Ounces pyroligneous acid,
1 Pint neat's foot oil.

Mix. If the acid is not to be easily obtained use strong cider vinegar. Prepare the following powders:

No. 39. 2 Ounces powdered gentian,
1 Ounce powdered golden seal,
1 Ounce powdered pleurisy root,
1 Pound powdered liquorice root.

Mix, and divide into six powders, to be given in the food night and morning.

IV. Nasal Gleet.

Causes.—This affliction sometimes follows distemper and strangles and is one of the attendants on glanders, sometimes running into it. It is sometimes caused by a chronic affection of the schneiderian surfaces. It is caused sometimes by the relaxing and enlarging of the ducts communicating between the cavities of the mouth and nose by disease, allowing the semi-liquid food and its juices to pass into the nostrils. This is true chronic gleet, and the discharge is tinged with what the animal eats. It is in one of its forms a suppuration of the mucus membrane lining in the facial sinuses, producing distortion and a terribly offensive discharge, which may have been produced by a blow on the face. In bad cases the cheapest way is to end the animal's misery by killing.

How to know it.—Discharge is not always present, neither is it uniform. Sometimes during fair weather it will be discontinued. The discharge is a thick yellow mucus tinged with green, if the food be grass, or with the color of the food. If it becomes purulent, that is pus, matter, and tinged with blood, it may end in ulceration of the cartilages of the nose, and in glanders. If the discharge is confined to the left nostril, is tenacious, elastic, accumulates around the edges of the nose, if there is enlargement of the lymphatic submaxillary gland, under and on the side of the jaw, it is cheaper to kill the horse, or else call in a surgeon, since for the proper treatment of the disease the trephine should be used, by which a circular piece of the bone may be taken out to facilitate treatment.

How to Cure.—In mild cases look for decayed molar (grinding) teeth; if found, remove them. Look for swelling of the frontal bone, produced by bruises. Put the horse where he may be comfortable, let his diet be light, but soft; fresh grass in Summer, with good food. Inject the nasal passages thoroughly with the following:

No. 40. 1 Ounce bayberry bark,
1 Pint boiling water.

When cool strain through a close linen or white flannel cloth, and inject daily.

Prepare the following:

No. 41. 1 Part Grains of Paradise,
1 Part white mustard seed,
1 Part powdered sulphur,
1 Part powdered charcoal.
Mix, and give one ounce daily in the food.

Give occasionally in gruel the following:

No. 42. ½ Ounce balsam copaiba,
2 Drachms sweet spirits of niter.

This with warm clothing and nutritious food will suffice for mild cases Where the trephine is not to be used, treatment must be persisted in until the animal is cured.

V. Nasal Polypus.

Polypus may form upon any of the cavities of the body which communicate with the air, being peculiar to the mucous membrane. These grown to such size as seriously to impair breathing, are accompanied sometimes by discharge of mucus which is pure. That is, it is thrown out as soon as formed, and therefore it is not fetid.

What to do.—If the polypus which is generally pear-shaped and attached to the membrane of the nose, by a small neck, can be made visible by causing the horse to cough, it may be removed by a ligature or a pair of polypus scissors by any physician, if no veterinary surgeon is at hand.

When the polypus is entirely concealed from view, tracheotomy may have to be employed before an examination can be made, since the polypus may have gone so far as to oppress the breathing. Thus in all cases of polypus, unless it be so low that a ligature can be employed to strangulate it at the neck, it is altogether better to call in the aid of a veterinary surgeon.

CHAPTER IV.

DROPSICAL AFFECTIONS.

I. DROPSY OF THE HEART. — II. DROPSY OF THE BRAIN. — III. DROPSY OF THE CHEST. — IV. DROPSY OF THE SKIN OF THE CHEST. — V. DROPSY OF THE SCROTUM. — VI. DROPSY OF THE ABDOMEN.

I. Dropsy of the Heart:

Causes.—The pericardium or membranous covering of the heart is subject to inflammation; by this inflammation and consequent obstructed circulation in the minute vessels that supply it an effusion takes place, and either thickens the walls of the pericardium itself, and thus contracts or compresses the heart, or it is deposited in the cavity of the pericardium in quantities varying from a pint to a gallon. This diseased condition is generally found in connection with dropsy of the chest or abdomen.

How to know it.—In the early stages of the disease there is a quickened and irregular respiration, with a bounding action of the heart. As the fluid increases the action of this organ becomes feeble and fluttering. There is a peculiar expression of anxiety and alarm on the countenance of the animal. If he does not die of the disease before the pericardium is filled, violent palpitations and throbbings characterize the advanced stage. The breathing becomes difficult, and when the head is raised there is a tendency to faint.

What to do.—If it is observed while there is yet a painful state of the pericardium by reason of inflammation—profuse effusion not having taken place—the first thing is to reduce the inflammation and allay the pain, and thus forestall the further accumulation of the fluid. For this purpose relieve constipation, which is usually found as an accompaniment, by moderate doses of salts, or of oil. Then give the following draught:

No. 43. 1 Oz. nitrate of potash,
15 Drops tincture of aconite,
1 Pint of water.

The animal must be kept comfortable, according to the season, and have a plentiful supply of fresh air and cold water.

If there are no indications of relief within four hours, give the following draught:

No. 44. 4 Oz. solution of acetate of ammonia,
10 Drops tincture of aconite,
12 Oz of water.

Repeat this after eight hours, and then leave off the aconite, but continue to give, at intervals, the acetate of ammonia in water.

If the disease has reached an advanced stage, and the cavity of the pericardium is largely filled with water, it is scarcely to be hoped that the animal may be saved; but even in that case the course here prescribed should be adopted, unless there is some more general disorder under such treatment as will render it unnecessary or objectionable.

II. Dropsy of the Brain.

Causes.—The remote cause of this disease (known also as hydrocephalus), is some constitutional disorder of the brain, or of its membranous covering—chiefly, as is believed, a scrofulous tendency. The immediate causes, or the excitants to its development, are various, as castration, foot puncture, staggers, acute diseases of the stomach, defective nutrition, etc.

How to know it.—At first an unnatural sleepiness will appear, with apparent unconsciousness and a tendency to reel when moving on foot. The pupil of the eye is perceptibly dilated; the animal breathes in a hard and grunting way; he tosses his head about and throws it upward or backward, as though in much pain. When down, with neck lying prone, as is often the case, he will sometimes raise his head, then drop it spasmodically, beating it upon the ground. If unrelieved, convulsions finally set in, and death ensues.

What to do.—If the head is hot with fever, denoting an acute attack, sponge frequently with cold water, and see that the bowels are kept moderately open. If there is decided constipation, as is sometimes the case, use an injection of soap-suds at intervals, until the bowels are moved. Then give the following in doses of 2 ounces, morning and evening:

No. 45. 4 Oz. fluid extract of buchu,
2 Oz. iodide of potassium,
6 Oz. water.

Continue this, keeping the horse from labor and as quiet as possible, until all symptoms of feverishness disappear from about the head, and the unnatural torpor no longer manifests itself.

III. Dropsy of the Chest.

Causes.—This disease, (called also hydrothorax), is frequently the sequel of pleurisy, and is the result of the inflamed condition of the large surfaces of the covering of the heart and lungs. The absorbents are inadequate to the taking up of the abundant effusion, so that the chest is filled, the lungs are pressed upon and death by suffocation follows.

How to know it.—The impaired appetite and chilliness of the ears and legs which characterize the last stage of pleurisy, change when it is about to assume a dropsical form, and the horse becomes more lively, his appetite returns, his legs and ears become warm, the eyes look more cheerful, and his manner is every way more encouraging. A few hours after this first apparent improvement, however, the breathing becomes labored, the muscles quiver and twitch, and the nostrils flap. The animal stands with the legs wide apart, head low, or resting upon something, neck stretched out, eyes staring, and the motion of the flanks increased, even brought into forcible heaving action. The pulse is more frequent, but small, irregular and fluttering; and the nose, ears and legs become cold again. His weakness rapidly increases, and if not relieved the animal dies, sometimes within a week, though he may linger much longer.

The disease may be detected in its early stage, or immediately after the horse has shown signs of relief from pleurisy, by placing the ear to the chest, near the breast bone. If the dropsical effusion has set in, the ear will detect no sound, nor will any be detected until the ear is placed high up the shoulder or flank, past the middle of the ribs. Holding it here, at the point where the breathing is first audible, and directing a slap to be made on the other side with the open hand, the examiner will hear a dull, splashing noise as though of disturbed water; and there need be no longer any doubt as to the nature of the case.

What to do.—In the first place adopt the use of diuretics and laxatives, that the various organs may be assisted in carrying off the accumulated fluid. For the first day give every six or eight hours, the following:

No. 46. 4 Drachms powdered nitrate of potash,
1 Fluid ounce tincture of cardamoms,
10 Oz. water.

Mix the potash and water, and when a clear solution is formed add the tincture, and give from the bottle twice or thrice in the twenty-four hours.

On the second day, two or three times a day give:

No. 47. 2 Fluid ounces solution of acetate of ammonia,
1 Oz. nitrous ether.

Mix with water and administer from the bottle.

If this treatment does not seem to be giving relief at the end of three to five days, draw off the liquid by tapping the chest. It is a simple and safe operation and will give relief unless treatment has been too long delayed, so that there is an accumulation of substances that will obstruct the mouth of the canula and prevent the flow of the liquid. The instrument to be used, the trocar, armed with a stylet, must not be large, as drawing off the water too suddenly would prove fatal. The smallest of those made for human practice is large enough, but it must be of greater length. Having the instrument, and that in good condition, select a place behind and about on a level with the elbow, and take a small portion of skin, between the eighth and ninth ribs, which must be pulled forward. Then make a narrow slit with a sharp knife upon the place which the skin originally covered. Still holding the skin gathered forward, insert the armed trocar into this opening and press it with such force as suffices to push it gradually onward until resistance ceases. It is then within the cavity of the thorax, and the stilet must be withdrawn, whereupon the water usually begins to flow out. Take all the water you can get if the horse will suffer so much to be withdrawn; but if at any time during the operation he shows signs of faintness, withdraw the trocar and let the skin fly back. It is necessary always to have the skin drawn forward so that on returning it may cover the wound lest the air may enter the chest from the outside, which would prove quickly fatal. In an hour or two after the first attempt a second may be made but the trocar must be inserted in a new place, as the first wound might be irritated by an effort to re-insert the instrument.

There is sometimes apprehension lest this operation may injure an artery by approaching too near the posterior border of a rib, but this is groundless, as the artery is protected by the groove through which it travels.

If the trocar is properly inserted, and no water flows, the case may be regarded as well nigh hopeless. A whalebone may be inserted to break away the pus or whatever substance may line the thorax, but this is not known to have ever resulted in any good.

If there is fluid on both sides, it should be drawn off on both sides at the same time, to prevent pressure upon the delicate divisions of the chest. The fluid is generally confined, however, to one side.

The operator should stay by the animal during the slow abstraction of

the water, so that upon any sign of faintness he may withdraw the trocar and prevent death through sudden collapse.

After the water is pretty thoroughly drawn off, be careful to give the patient as much nourishing and carefully prepared food as he will consume; and the following tonic ball should be administered night and morning for several times on alternate days:

No. 48. 1 Drachm iodide of iron,
½ Grain strychnia,
¼ Drachm sulphate of zinc.
4 Drachms extract of gentian.

IV. Dropsy of the Skin of the Chest.

Causes.—This is an effusion of fluid underneath the skin of the chest, and it is a sequel to various diseases—beginning generally to manifest itself only after the animal is reduced to a debilitated state. It is most likely to occur in the Spring and in the Fall of the year, at the time of changing the coat.

How to Know it.—A swelling appears on the chest and somewhat between the forelegs; and its dropsical character may be known by its yielding to pressure of the fingers with a fluctuating feeling.

What to do.—If it is the accompaniment of any more general disorder the first thing, of course, is to remove that primary disease. Meanwhile if the fluid accumulates in any considerable quantity, draw it off with the trocar; and if there is not too much soreness, subject the part to regular and moderately vigorous friction occasionally for some days.

Diuretics are always good in these dropsical complaints. No. 45 is good. It is important that the bowels be kept regular, and that good nutritious food, as boiled oats or boiled barley, with wheat bran, be given regularly, and in sufficient quantity to nourish well. Give 4 drs. of gentian every other day for a week or two.

It must be remembered that these medicines are to be given only in case there is no treatment in progress for a more general disorder.

V. Dropsy of the Scrotum.

Causes.—This is usually found in connection with dropsy of the abdomen, and arises from either local injury and consequent inflammation, followed by effusion, or by sympathy from that cause which has produced the general abdominal trouble.

How to Know it.—It is readily known by a chronic distension of the part, except when mistaken for scrotal hernia or rupture, from which it

may be distinguished by its not passing back with a sudden movement, when pressed with the fingers, but with a steady current and gradual diminution

What to do.—If it is associated with dropsy of the abdomen treat that first, and until it is relieved, without which being done it is unnecessary to attempt the cure of the more local and dependent disorder. In any event, find out, if possible, and remove the primary cause. Next see to it that the bowels of the patient are kept moderately active; and as in the case of dropsy of the abdomen, give sufficient of diuretic No. 45, to act freely upon the kidneys.

If the fluid has accumulated in any considerable quantity, so as to render the scrotum painful by distension, draw it off with a fine armed trocar, or a hypodermic syringe, and support the parts with an elastic bandage.

VI. Dropsy of the Abdomen.

Causes.—This is a collection of water in the abdomen which is generally the result of chronic inflammation of the peritoneum, a tough, white membrane which lines the abdomen and embraces the bowels in its folds. When this inflammation has assumed a chronic condition, the peritoneum secretes a watery fluid, because of long obstructed circulation, which fills the cavity, and unless attended to will finally cause death.

Frequently it follows injuries of the abdominal walls, when the peritoneum has been subjected to violence, and is associated with local inflammation of the muscular tissues, from which effusion is directed inward.

Sometimes it arises from obstructed circulation caused by diseases of the liver, lungs or heart, and again from a poor, watery state of the blood, superinduced by exhaustion or by scanty and innutritious food.

It is more frequently found in old than in young and vigorous animals.

How to know it.—Generally, a low state of health precedes the more unmistakable manifestations; there is thirst and loss of appetite; the pulse is hard and small; the membrane of the nose is pale; the mouth is dry; the head droops; there is a condition of weakness and languor; and there are some signs of heart and liver diseases; pressure upon the abdomen is so painful as to cause a groan. Sometimes there is local dropsy of the sheath, legs and breast, as well as of the belly. The bowels are apt to be constipated, but are sometimes irregular; and the coat is loose and staring.

When the water has begun to fill the cavity, the horse manifests a desire to lie down and remain long in one position; there is a gradual enlargement of the abdomen, and as the fluid increases there is increased

difficulty in breathing. In the chronic stages of the disease, the progress is slow; but the belly becomes more and more baggy; and in some instances the hair of the tail comes away easily or drops out, showing that the skin and capillary glands of that part of the body are affected.

The presence of water, when it has collected in any considerable quantity, may be detected by placing the ear to the abdomen and having some one slap the horse on the opposite side with the open palm.

In mares, this enlargement of the belly is sometimes mistaken for a pregnant condition; but it may be readily distinguished by a fluctuating feeling which follows a pressure upon the parts with the fingers, a sort of fluid motion, as of water forcibly displaced.

What to do.—If it is known to proceed from local injuries, or from diseases of the vital organs, it is scarcely necessary to adopt any course of treatment, unless, indeed, the primary disease can itself be removed; but when it depends upon inflammation of the peritoneum, or when it results from bad or deficient food and unwholesome surroundings, place the horse in a good, dry and well-ventilated stall, feed him generously, and give him the following tonic ball, night and morning:

No. 49 — 1 Oz. powdered digitalis,
¼ Oz. sulphate of iron.

Mix with mucilage and a spoonful of linseed meal to form a ball of sufficient firmness for handling.

It is important that the kidneys should be kept active, and the following diuretic must be used for that purpose:

No. 50. — 2 Pounds soap,
2 Pounds nitrate of potash,
3 Pounds rosin,
2 Pounds Venice turpentine,
¼ Pint oil of turpentine,

Melt the soap and rosin slowly together, and stir in the other ingredients while the former mixture is cooling. Make it into 2-ounce balls with linseed meal, and give one at a time as often as necessary to keep up a somewhat copious action of the kidneys.

If at any time the water accumulates in a great quantity, draw it off by means of a fine trocar, plunged into the most dependent or lowest part of the distended abdomen.

CHAPTER V.

DISEASES OF THE THROAT, CHEST AND LUNGS.

I. CHEST-FOUNDER. — II. BRONCHITIS. — III. PNEUMONIA, OR INFLAMMATION OF THE LUNGS.——IV. CONSUMPTION.——V. PLEURISY.——VI. COLDS.——VII. ENLARGED GLANDS. VIII. SWELLED THROAT, OR LARYNGITIS. —— IX. CHRONIC COUGH. —— X. MALIGNANT EPIDEMIC. —— XI. DIFFICULTY OF BREATHING. —— XII. BROKEN WIND, — BELLOWS, — HEAVES.——XIII. INFLUENZA.——XIV. PINK EYE.——XV. BLEEDING FROM THE NOSE. ——XVI. STRANGLES.——XVII. SPASMODIC ACTION OF THE GLOTTIS AND EPIGLOTTIS.

I. Chest-Founder.

This when it is not soreness of the muscles from hard work, is rheumatism in its acute form. Sometimes it is caused by lesion, or straining of the muscles or the tendons connected with them.

Causes.—It may be brought on by suddenly allowing the horse to become chilled after heating, giving large drafts of cold water when warm, or driving him into cold water up to his belly when heated.

How to know it.—The horse is dull; his coat may be staring; he is stiff, and moves unwillingly. Sometimes the soreness extends to the limbs; usually does from sympathy. There is fever in the parts affected and accelerated pulse, the latter from 70 to 80 beats in a minute. Also, sometimes profuse sweating and heaving at the flanks, but the legs will remain warm. The parts affected may be more or less swollen, but always tender to the touch.

What to do.—Clothe the horse warmly, and put him where he may be kept so. If the animal is fat, and full of blood; if there is evident determination of blood, bleed moderately, say a pint from the neck vein.

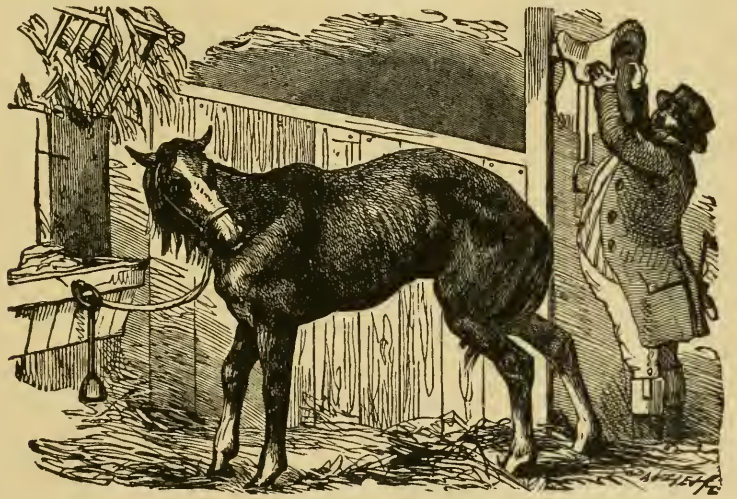
We never, however, advise bleeding, except by a veterinary surgeon or physician who knows his business. Wash the throat in warm salt and water. Relieve the bowels as soon as possible by an injection of soap suds, if the rectum be impacted. Give as a laxative 4 drachms Barbadoes aloes. Pulverize and mix into a ball with molasses and linseed meal to form a mass or give the following:

No. 51. ½ Oz. ground ginger,
1 Drachm tartar emetic,
1 Pint salt and water.

Mix and give as warm as the horse can swallow it. As a rule the horse being thoroughly physicked will get better; if not, apply a mild blister.

No. 52. 1 Oz. powdered cantharides,
8 Oz. lard oil.

Heat to blood heat and mix thoroughly. Shave the hair from the breast, wash with warm vinegar and apply the mixture rubbing it well in. When the blisters rise dress with a plaster of mutton tallow.



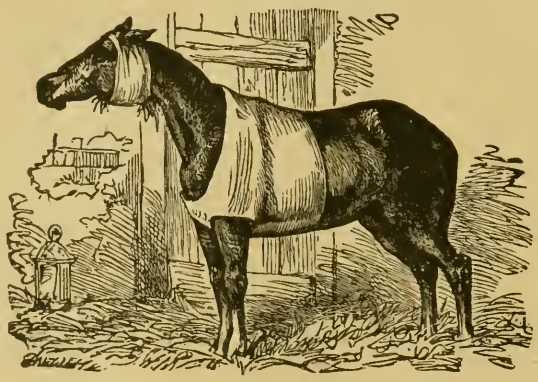
A FIT SUBJECT FOR FOUNDER OR BRONCHITIS.

II. Bronchitis.

Causes.—Exposure of a heated and steaming horse to chill, or over exertion, and leaving the horse in the stable, when the system is quite relaxed. Riding to town and leaving a horse in the cold and wind while the owner is making himself comfortable. There is first a cold, enlarged glands and swelled throat. The inflammation extends down from the

larynx through the trachea into the bronchial tubes and air passages of the lungs, and ends sometimes in confirmed and incurable bronchitis.

How to know it.—In the acute stage there is difficulty and rapidity of breathing, from the filling of the membranes with blood and the consequent diminishing of the size of the tube. After a time mucus is formed and increases the difficulty of breathing and causes a cough. The pulse will be 60 or 70 beats per minute; the cough will become hard and dry, and the sound in the throat will be rattling, and after the secretion of mucus a gurgling sound will be given similar to that made in blowing soap bubbles. In extreme cases the breathing becomes extremely laborious, the cough is constant and distressing, the legs are extended, and at length the animal dies of suffocation.



A HORSE DRESSED FOR BRONCHITIS.

What to do.—The first step is to find the extent of the inflammation. *Never bleed.* Clothe the animal warmly and give an injection of warm water to relieve the bowels. Avoid all strong purgatives. In fact, give none unless the bowels are decidedly bound up. Let the food be soft and laxative, green grass in Summer, or mashes and gruels in Winter. For the throat, scalded soft hay, fastened by means of the eight tailed bandages, will be good. Wash the neck and chest with a weak decoction of tobacco as hot as it can be borne. When dry, shave the hair from the chest and apply a blister of better strength than that advised for chest founder The following will be good:

No. 53. 1 Ounce powdered cantharides,
1 Ounce powdered resin,
4 Ounces lard oil.

Melt the resin and lard together, with just sufficient heat to melt the

resin. Add the cantharides and stir until it sets together. Apply to the chest and throat if the case is desperate. If only irritation is desired the following will be good:

No. 54 — 4 Ounces lard oil,
1 Ounce turpentine,
6 Drachms powdered cantharides.

Shave the hair and apply by rubbing in.

For the body prepare a strong cloth as shown on preceding page. Get two pieces of flannel three yards long and the full width of the fabric, also four pieces half a yard long and a foot wide. Saturate one of the pieces with cold water, fold, and apply near the top of the back, equally on each side. Two of the smaller pieces are to be saturated with water and laid along the sides of the chest, fasten the jacket at the back so as to hold all snug. When the flannels are warm remove them and replace immediately with others. So continue for two or three hours as the case may be, and then allow them to remain until the animal is pretty well recovered.

In very aggravated cases of congestion give every half hour until the pulse regains its tone, and then at longer intervals, reduced at last to once a day, the following:

No. 55. — 1 Ounce sulphuric ether,
1 Ounce laudanum.
1 Pint water.

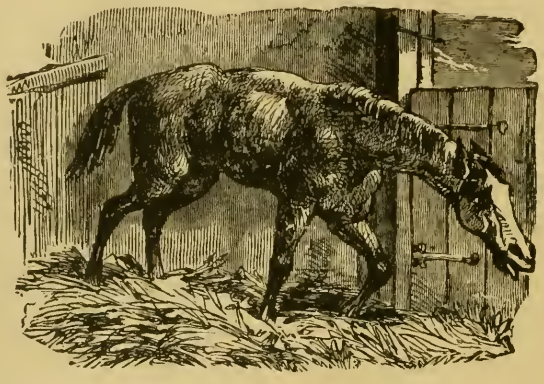
At the third dose discontinue if the effect required is not produced and give the following:

No. 56. — ½ Drachm of solid belladonna.
½ Pint of warm water.

Rub down the belladonna with the warm water. Give this exclusively every hour until the pulse is better, then withdraw half the laudanum and add half a drachm of belladonna to the drink first recommended (No. 55), resuming it as directed. Let the food be thick gruel of oatmeal, boiled potatoes, and oatmeal and bran mashes. Give no dry, and especially no dirty food. When the animal begins to recover so as to eat whole grain, grass and hay, let them be especially freed from dust, and let them be given moistened, until the horse be perfectly recovered

If the disease is to terminate fatally, the pulse will grow quick and tremulous. In drawing the breath the body will quiver, showing increasing difficulty and pain. The membrane of the nose becomes of a bluish tint with frothy blood and purulent matter about the nostrils. The

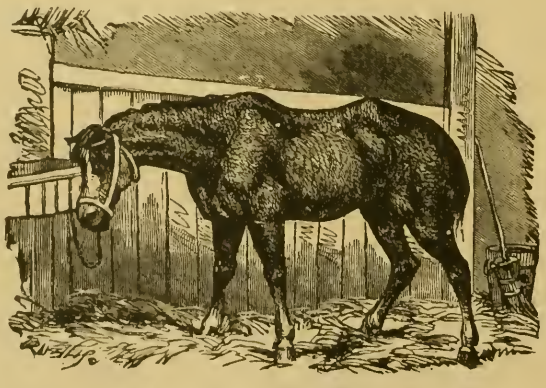
respiration, will become more and more difficult, and the cough most distressing, and continuing until a quantity of fluid matter is ejected from the nostrils, only again and again to be resumed. Thus the animal suffers and dies, or else slowly recovers, remaining through life with the cough of incurable bronchitis.



A COUGH OF INCURABLE BRONCHITIS.

III. Pneumonia, or Inflammation of the Lungs.

This may follow acute congestion of the lungs, this being really its first stage, though often not noticed, by the ordinary observer, as such. But congestion may occur in its sudden and fatal form from overtaxing a fat horse, or one otherwise out of condition. Suppose from hard driving or hard riding he hangs heavily on the bit; droops and staggers;



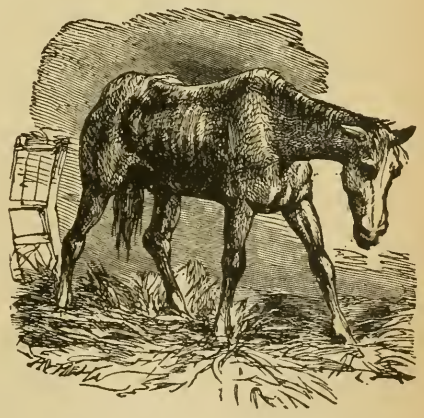
A CASE OF CONGESTION.

if not pulled up he may fall; or getting to the stable he stands with dilated nostrils, extended head, quick, convulsive or labored breathing, eyes staring and bloodshot, his nasal membrane deep red or blue, and

pulse rapid and weak; if in putting the ear to the chest there is a loud respiratory murmur with crepitation (a peculiar slight cracking sound); if the heart, as felt behind the left elbow, is beating tumultuously; if the limbs are cold, with perspiration breaking out on different parts of the body, there is no time to lose. In extreme cases bleed at once from the neck vein. The blood will be turbid, dark, almost jelly-like in very bad cases.

Remove everything from the animal that may impede breathing, and allow him plenty of fresh air. Give an active stimulant, the easiest to be had; whisky, four or five ounces, or a tumbler full in a half pint of water. If this cannot be had give an ounce of ground ginger in a pint of water, or a half ounce of oil of turpentine in half a tumbler of water. Give also warm water injections to relieve the bowels, and also active hand rubbing of the legs to promote circulation to the surface, while the body is enveloped in blankets wrung out of hot water, and covered with dry ones. If the patient does not soon recover under this treatment the case will be one of pneumonia.

How to know it.—If the disease does not succeed to the symptoms we have just described, those of acute congestion, there will be a chill with shivering, and generally a dry cough, but deep as though from the chest. There will be a hot skin, indicating fever, quick-labored breathing, a full but oppressed pulse. The membranes of the eyes, nose and mouth will be red, and as the disease advances a yellowish or whitish matter will come from the nostrils. The horse will always stand with the legs wide apart; so will the ox in bad cases, and the latter will moan with each expiration of the breath. Generally the ox will lie down. There will be crepitation of the lungs about the seat of the disease, and a more than normal murmur upon applying the ear. By percussion, striking the affected parts, there will be flinching and even groaning, but except at the seat of the disease the chest will retain its healthy sound, while the diseased parts will sound dull and solid. Thus, by the ear, and sounding by the hand, the progress of the solidification of the lungs may be followed from day to day.



THE POSITION ASSUMED BY THE HORSE DURING AN ATTACK OF PNEUMONIA.

What to do.—Under the advice of a veterinary surgeon or physician, blood may be drawn. If none such are near, if the animal be young and

plethoric, blood may be drawn in the earlier stages. Place the animal in a loose box stall, with plenty of ventilation to the stable. If the bowels are costive, loosen them by injections of warm water. Bandage the limbs to keep them warm, and give the body such clothing as the necessities of the case seem to require. Let the food be simple, laxative and cooling. Bran mashes, boiled carrots, linseed meal, soft sweet hay. Do not check diarrhœa or profuse staling; it is an effort of nature to relieve the system. If there is fever, give plenty of water. If there is swift pulse and oppression of the lungs, give 20 to 30 drops of tincture of aconite in half a pint of water, or 1 to 2 drachms of tincture of veratrum in water every two hours. If under this treatment the system becomes depressed, and it must be watched, discontinue. If the pulse falls—if there is trembling sweats, and a peculiar anxious expression in the eyes, discontinue. If there is great exhaustion, give moderate doses of whisky, but discontinue it unless good effects are seen. If there is much weakness, give two drachms each of camphor and of carbonate of ammonia, made into a ball with molasses and linseed meal, twice a day. In the case of considerable congestion, strong mustard poultices will be indicated, to be applied to the chest; or in extreme cases, blister.

In the case of cattle, the same general treatment should be followed. Double the quantity of aconite and ammonia should be given. As a rule, cattle require more than the horse; and in giving medicine to cattle it must trickle down the throat, in order that it may not pass into the first stomach.

In this disease symptoms must be watched. Good nursing is of especial value, and as the animal begins to recover, give soft and easily digestible food, and assist the system if necessary with wine, ale or whisky in very light doses.

IV. Consumption.

This hereditary affection is much more common in the West than is generally supposed. More common in cattle and even in sheep and swine than in horses. In horses it is comparatively rare. The disease may be communicated to healthy animals by inoculation, and by eating the raw flesh of diseased animals, and it may also be superinduced in animals predisposed to the disease by local inflammation; so also the germs may be received in milk, when the disease has invaded the mammary glands of the cow. Deep milking cattle with narrow horns, thin necks and narrow chests are especially predisposed to the disease. Tubercles may be developed in any part of the body, even, in rare cases, the bones and muscles; the lungs, the spleen, the liver, the pancreas, the ovaries and the kidneys are the usual seats of the disease.

Causes.—Badly constructed and illy ventilated stables; moving from a warm to a cold climate; exposure to cold and wet; or any thing which tends to lower the health in a predisposed animal will bring on the disease.

How to Know it.—The disease may be acute, carrying off the animal, sometimes, in a few weeks. It is generally chronic. The attack is insidious, tubercles often being formed before danger is suspected. There is a general dullness and loss of spirit, tenderness of the withers, back, loins, and of the walls of the chest. In cattle the nose will often be dry, showing fever; the ears and horns will be hot; the skin loses its elasticity and pliant quality. The heat of the body may go up to 102 degrees; the pulse is weak but accelerated, and there is a slight, dry, but not frequent cough; the lymphatic glands about the throat may be enlarged and there may be swelling of the joints. If the chest is sounded there may be heard a murmuring sound hoarser than natural, if it be listened for just over the lower end of the wind pipe or in the chest. As the disease advances, the eyes become more and more sunken, the skin becomes more and more hide bound, the hair is dry and erect. If the bowels are involved there will be more or less scouring, and if the lungs are principally affected there will be swelling and lameness, labored breathing, exhaustion and profuse perspiration occurring upon the slightest exercise. There will be temporary windy distention of the stomach after feeding, and the appetite fails. The cough increases with rattling, the discharge at first light, increases. There is crepitation (a rattling or snapping sound) of the lungs, with a whirring or gurgling of the chest, and percussion gives a dull sound, with wincing when the parts covering them are handled. So if tubercles are formed in the liver, pancreas, or kidneys it will show the involvement of these parts. Recoveries are rare. Occasionally calcification of the tubercles occurs in animals naturally of a strong constitution, but the disease usually ends in death.

What to do.—A cure is scarcely ever accomplished. The symptoms may be mitigated. The animal must have dry, pure air, plenty of sunshine, Summer and Winter, and be protected from sudden changes, and must be kept warm. The food should be light and digestible, good grass in Summer and ground food with linseed meal and roots in Winter. In the early stages of the disease four to five drachms of gentian may be given daily in the food, at two or three doses, alternated with two drachms of sulphate of iron as a tonic. As an expectorant, and diaphoretic, give occasionally three to four ounces flowers of sulphur every other day, or once in three days, or to act on the skin and as a diuretic, the following:

No. 57. 2 Ounces of flowers of sulphur.
2 To 3 three drachms powdered resin.

Mix and give a dose daily until the effect is produced; and afterwards as needed. As an antiseptic (to counteract putresence) the fumes of burning sulphur would be indicated.

How to Prevent.—From what we have written the owner will understand the difficulty attending the treatment of this disease, and also its dangerous character in the case of cattle. The flesh and milk it is better not to use at all, although danger can be destroyed by the most thorough cooking. Using consumptive animals as breeders, or selling the milk of consumptive animals should not be thought of. Drainage, good pasturage, a warm, sunny location for the stables and yards, care against all chronic and debilitating diseases, good, liberal feeding, especially when animals are giving milk, the prompt removal of all consumptive animals from pastures and buildings, and the thorough fumigation of the latter is recommended.

V. Pleurisy.

This is an inflammation of the membrane lining of the chest and covering of the lungs. It is common to all domestic animals, in exposed situations and those liable to rheumatism. The pleura is one of the serous membranes, those lining close cavities, as the chest, abdomen and joints. In health they are insensible to us, but under the effects of inflammation the most sensitive and painful possible. Since every inspiration and expiration of the breath moves these membranous linings upon each other, we can at once see the extreme anguish it must occasion. If relief is not soon obtained the disease quickly ends in death.

How to know Pleurisy.—There will be some alternations of shivering followed by heat of the skin, sometimes extending to the limbs. There will be localized sweating and congestion of the muscles. If confined to one side the foot of that side will be extended. The animal will look at the flank, lie down, rise again, and there will be general uneasiness indicative of pain. The pulse will be quick and hard, seeming to strike the finger under the compression. There will be inclination to cough, but which the animal will fear to exercise. The cough is not always present, but when so, is always suppressed, short and hacking. The breathing will be hurried, but apparently confined to the abdominal muscles, the inspiration short and checked, but the expiration slow and prolonged. In pneumonia and bronchitis there is often intense redness of the nose, in pleurisy less. There is no nasal discharge and the heat of the breath is not so great as in pneumonia. After effusion of serum (fluid matter or water) into the cavity of the chest ensues, which may be in 24 or 36 hours, the pulse becomes soft, and the animal seems better. If

the effusion is re-absorbed the animal will recover. If not, the pulse loses its full tone, and again becomes hard and quick. The breathing is again difficult and attended with lifting of the flank and loin. The nose and head is extended, the nostrils are dilated, with signs of suffocation. The pulse at length becomes weak, thrilling at each beat until at length the animal wavers, staggers, falls and dies.

An attack of pleurisy is often taken by those unacquainted with the disease for spasmodic colic. This error, if made, will probably be fatal to the animal affected. In colic the pulse is natural at the commencement, and the paroxysms of pain are of short duration. In pleurisy the artery is thin, the pulsations seem to strike the fingers, but the stroke is short. The pain is continuous, the body hot, but the feet generally cold.

What to do.—The same general care as in bronchitis and inflammation of the lungs is to be observed. If there is a chill, wrap the horse completely in blankets wrung out of hot water, and cover with dry ones. When removed,do so a little at a time, rubbing dry, and re-clothe warmly. If taken in its earliest stage, give:

No. 58. ½ Ounce laudanum,
½ Pint linseed oil.

This will often prove effective; if not, repeat the dose in a few hours For an ox, give double this dose. If the symptoms increase, apply a strong mustard poultice to the side of the chest, or a blister. No. 53 may be applied to the chest. The bowels should be kept moderately open. If effusion of water takes place, give 6 drachms of acetate of potassa once or twice a day in a pail of water. The following will be found excellent in place of the last named remedy, if there is weakness and a rapid pulse (70 to 80), and scanty urine:

No. 59. ½ Ounce tincture of chloride of iron,
¼ pail water.
Give as a drink twice daily.

The effusion of water not yielding, the chest may be tapped with a trochar. Divide the skin with a lancet, between the eighth and ninth rib and near the lower end. Be careful the air does not enter. Draw off only a part of the water if it produces a shock. In this, one should have the advice of a veterinarian. Repeat in 24 to 48 hours. The animal should be kept up with sulphate of iron, two drachms, twice a day, in water, with stimulants and easily digestible and nutritious food.

It is absolutely necessary, after effusion of water has taken place, that the urine should be passed freely to assist absorption. To this end the following will be indicated:

No. 60. 1 Drachm iodide of potassium,
1 Drachm carbonate of ammonia,
½ Ounce powdered gentian.

Give twice a day as a drench in a quart of water, or as a ball mixed with linseed meal and molasses.

VI. Colds.

Colds in horses, as in the human family, are usually the result of improper care or undue exposure. Taking a horse from a hot, illy ventilated stable, and allowing him after driving to become cold, is one prolific cause of colds. There are so many means of causing this disability that it would be impossible to enumerate them. If the attack is light, all that will be necessary will be to clothe the animal warmly and relax the bowels with a warm mash, and give rest for a few days.

A HORSE'S HEAD WITH COLD.

Sometimes, however, the attack is prolonged and severe. The appetite ceases, the coat roughens, parts of the body are hot and others cold, the membrane of the nose at first dry and pale, with the facial sinuses clogged, at length terminates in a discharge more or less great, but without improving the health of the horse.

What to do.—Keep the animal warmly clothed, in ample box stall, with plenty of bedding. If the cold does not give way in a few days after the first attack, and the symptoms are as we have indicated, or if the membranes of the nose are dry, make a sack of coarse gunny cloth, large enough so it may fit the nose properly, but enlarging to the bottom, and two feet or more long, with a slit covered with a flap in the side, half way down. Put into the bag half a peck or more of coarse pine sawdust with which half an ounce of spirits of turpentine has been thoroughly mixed. Place the bag on the nose as shown in the cut on next page.

Turn two gallons of hot water in the slit, and every twenty minutes repeat, allowing the bag to remain on an hour each time, use this six times a day until the discharge begins. When water runs freely from the nose, three times daily will be enough. Let the food be good scalded oats or other like food, with mashes if the bowels are constipated.

An animal with this kind of a cold should not be put to steady work until entirely recovered. The result of protracted cold is great weakness, and work before recovery often leads to disease of the air passages and lungs. If there is much fever give the following:

No. 61. 2 Drachms spirits of ammonia,
2 Drachms ether.

Mix and give in a little gruel, (say 1-2 pint,) twice a day. If the throat is involved poultice it with linseed meal in which a little mustard has been mixed. When the symptoms give way and improvement begins, or if the appetite is not good prepare the following:

No. 62. 2 Ounces powdered gentian,
2 Ounces carbonate of ammonia.

Form this into a mass, with linseed oil and molasses, divided into eight parts and give one twice each day. If the cold becomes chronic it ends in catarrh. When there are catarrhal symptoms and sore throat give the following:

No. 63. 1 Drachm extract of belladonna,
2 Drachms ipecac,
2 Drachms powdered camphor,
4 Drachms nitre.

Mix into a ball with linseed oil, and give one every three or four hours. In inveterate or chronic cold there is discharge, and swelling of the lymphatic gland. We have already shown how glanders may be known.

HEAD WITH LYMPHATIC GLAND OF THE THROAT SWOLLEN.

1—The enlarged lymphatic within the jaw.

We give a cut showing the enlargement of the lymphatic gland in chronic cold. In case the horse gets cold it is better that he be examined by a competent veterinary surgeon, (not by a quack,) in order to be sure the disease is not glanders.

NOSE BAG FOR STEAMING HORSE WITH COLD.

VII. Enlarged Glands—Goitre.

There are various glands in the throat that are subject to enlargement from disease, and which remain permanent after the disease is passed. This result is generally more unsightly as a blemish than as a real disability. Goitre, however, is a disease peculiar to some limestone regions, producing in animals as in man a swelling of the thyroid gland. In some portions of the East it is quite prevalent, producing extensive enlarge-

ments in lambs. It also attacks cattle and swine. In solid-hoofed animals, as in the horse, there may be a swelling on either side; in others it is in the center just below the roots of the jaws. For all enlargements of the glands, tincture of iodine will disperse the swelling if it may be possible. In bronchocele or goitre, rainwater only should be given to drink; iodine in doses of ten grains daily may be given on an empty stomach, and the swelling may be painted with the tincture. This to be persisted in for months. Another remedy that has been successful, is the following:

No. 64. ½ Drachm iodide of potassium,
1 Drachm liquor potassæ,
½ Pint rainwater.

Mix, and give as a dose night and morning, using the tincture of iodine on the goitre.

VIII. Swelled Throat, or Laryngitis.

Causes.—Foul stables or any cause producing colds, catarrhs, etc. It is sometimes divided professionally into laryngitis and pharyngitis, but practically they are one—inflammation of the air and food passages of the neck, generally accompanied with cough, difficulty in swallowing and fever.

How to Know it.—The animal is dull. The head is carried in a peculiar manner, as though the neck were stiff. There is a short, frequent cough, the breath is hurried, the pulse full and throbbing, and the membranes of the nasal passages are high colored, almost scarlet. There will be a hoarse sound, approaching to a grunt, at each breath taken, if the ears are held against the animal's wind-pipe. Externally there is more or less enlargement over the region of the larynx, the enlargement of the windpipe next the throat. Handling the throat seems to produce extreme pain.

What to do.—Reduce the pulse at once by doses of tincture of aconite in a wine glass full of water, repeated every half hour. Place the steaming-bag on the nose, as recommended for colds. Keep it employed almost constantly, for there may be danger of strangulation. If the steaming seems to distress the animal, omit it, or use it only occasionally, and soak soft hay in boiling water and apply to the throat as hot as can be borne. Bandage and fasten with the eight-tailed bandage previously described. Or, ferment the throat with cloths wrung out of hot mustard water. If there is difficulty in swallowing, put a teaspoonful of the following well back on the tongue several times a day:

No. 65. 1 Ounce powdered guaiacum,
4 Ounces powdered chlorate of potash,
¼ Pint of molasses.

Do not in administering anything, force the jaws wide apart. Act as gently as possible. If the animal is feverish and the throat hot and dry, give three times a day, in a pint of cold linseed tea, the following:

No. 66. 1 Drachm powdered ipecac,
1 Ounce solution of acetate of ammonia.

In case the disease becomes chronic, the following excitant to the throat will be indicated:

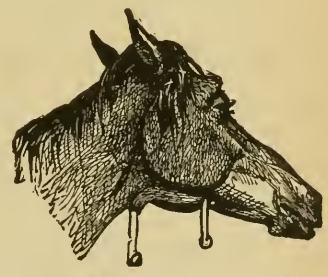
No. 67. 1 Part oil of turpentine,
1 Part solution of ammonia,
1 Part olive oil.

Mix, shake the bottle before using, and rub well in on the throat every day. If this does not relieve, apply the following blister:

No. 68. 1 Drachm croton oil,
1 Drachm sulphuric ether,
10 Drachms alcohol.

Mix, and apply by rubbing with considerable friction.

A HORSE WITH THE THROAT BLISTERED.



A SETON IN THE THROAT OF A HORSE.

When the symptoms become more favorable, by the membranes of the nose becoming pale or more natural in color; by the cough becoming more free, or louder, easier and with less violent breathing, and by the appearance of a white and thick discharge from the nostrils, put a seton in the throat, (see cut,) and allow nothing but moist and succulent food. Move the seton daily until healthy pus (matter) is formed. Then cut one of the knots and withdraw it, and as the horse recovers allow drier food—hay and grain—but that entirely free from dust. See that no stones or grit are in the oats, and soak for five or six hours before feeding. In this, as in diseases where the throat is more or less sore, the horse may quid his food. This is not a symptom of laryngitis as is some-

times supposed, but known to all diseases where there is obstruction in swallowing.

IX. Chronic Cough.

A HORSE QUIDDING.

There are many cases of long standing or chronic cough. Cough is an attendant upon so many disorders of the air passages, from the most trivial difficulty in teething to glanders, that a cough should not be overlooked in the diagnose of diseases. And so many diseases leave the patient with chronic cough, that its symptomatic stages should be carefully observed.

Coughing tends generally to a thickening of the membranes. When the membrane covering the larynx becomes thickened, and consequently morbidly sensitive, the cough becomes fixed or what is termed chronic.

The sense of smell in the nose is peculiarly acute, and the membranes of the nose and throat, as a matter of course, are fully as sensitive. We have said, "the limbs and feet are half the horse; the lungs the test of his endurance." Yet nine in ten of the stables in which horses are kept are offensive to man and irritate the air passages when first entered. Yet the sense of smell in man is not very acute, except in a few directions. A stable therefore, offensive to man is not a fit place for horses to be kept, where the lungs constitute one of the principal excellencies of the animal.

THE ACT OF COUGHING.

The cough which accompanies the several diseases of which this volume treats, will be described in the treatment of the diseases themselves. In this article chronic cough will be treated, the cough that is always present in eating, drinking and inhaling a cold draught of air, or from

any cause of excitement, requiring long and careful nursing for their cure. The chronic cough, resulting from colds, is hard and metallic. For this, the following will be good, to be rubbed on the throat and around the windpipe, once in ten days:

No. 69.
15 Drops croton oil,
1 Ounce glycerine,

Give twice a day, for a week, the following:

No. 70.
40 Drops diluted prussic acid,
1 Ounce niter,
1 Ounce bicarbonate of soda,
1 Quart water.

If this does not give relief, the following, valuable for irritable chronic cough, the result of influenza or sore throat, may be used:

No. 71.
1 Ounce Fowler's solution of arsenic,
1 Ounce chlorate of potash,
1 Drachm belladona.

Give once a day in water or gruel and note results, ceasing after a week or ten days, if no improvement ensues. For cough and sore throat, when first discovered, take:

No. 72.
1 Drachm powdered camphor,
1 Drachm extract belladona,
2 Ounces sweet spirits niter.

Give in a pint of cold gruel three times a day. Tar-water is well known to be valuable in obstinate coughs. Give every morning as a drink, the following:

No. 73.
1 Drachm powdered squills,
½ Pint tar-water,
½ Pint lime-water.

If the cough is violent, use as a sedative, the following:

No. 74.
1 Drachm dilute prussic acid,
2 Drachms powdered opium,
4 Drachms niter.

Mix in a pint of linseed tea and give from five to six table-spoonfuls three times a day.

Expectorants, calculated to loosen the cough and restore the secretions to their natural conditions, do not act so kindly as could be wished on farm animals. For a long standing cough, try the following:

No. 75.
1 Drachm aloes,
1 Drachm squills,
2 Drachms gum ammoniacum.

Mix into a ball with meal and give once a day in the morning. If the cough is irritable and easily excited, and the bowels natural, omit the aloes and substitute for it one drachm of opium.

For a cold settled in the chest, with cough, give every morning the following:

No. 76.
1 Drachm ipecac,
1 Drachm liquorice powder,
½ Ounce nitrate of ammonia.

Add tar, the size of a hazel-nut and mix with molasses to form a ball. All coughs resulting from indigestion or worms, and some of those resulting from irritation of the passages of the throat, are often cured by turning the horse out in Summer where he may have free range on the prairie, where resin weed grows plentifully. A long standing cough, however, requires time, and the operator must use judgment in administering medicine. If he be a veterinary surgeon he will make up his mind from various symptoms. The farmer should endeavor carefully to do the same.

X. Malignant Epidemic.

Under this head the older veterinarians were accustomed to term several diseases that sweeping over a country became unusually prevalent or fatal. Thus Dr. Layard and Ohmer long ago wrote of malignant epidemic, probably a severe form of catarrhal fever, or epidemic catarrh, and also known as influenza distemper, malignant epidemic, murrain, pest, etc.

Youatt describes a malignant disease occurring in 1714 in England, imported from the continent and destroying in the course of a few months 70,000 horses and cattle. Professor Bruquon, of Turin, says of this disease, that it commenced with loss of appetite, staring coat, a wild and wandering look, and a staggering from the very commencement. The horse would continually lie down and get up again, as if tormented by colic; and he gazed alternately at both flanks. In moments of comparative ease there were universal twitchings of the skin and spasms of the limbs. The temperature of the ears and feet was variable. If there happened to be about the animal any old wound or scar from setoning or firing, it opened afresh and discharged a quantity of thick and black blood. Very shortly afterward the flanks, which were quiet before, began to heave, the nostrils were dilated, the head extended for breath. The

horse had, by this time become so weak that, if he lay, or fell down, he could rise no more; or, if he was up, he would stand trembling, staggering, and threatening to fall every moment. The mouth was dry, the tongue white and the breath fetid; a discharge of yellow or fetid matter proceeded from the nose and fetid matter from the anus. The duration of the disease did not exceed twelve or twenty-four hours; or if the animal lingered on swellings of the head and throat and sheath and scrotum followed, and he died exhausted, or in convulsions.

Black spots—extravasation—were found in cellular membrane, in the tissue of all the membranes, and on the coats of the stomach. The mesenteric and lymphatic glands were engorged, black and gangrenous. The membrane of the nose and pharynx were highly injected, the lungs were filled with black and frothy blood, or with black and livid spots. The brain and its meninges were unaltered.

XI. Difficulty of Breathing.

From whatever source this may arise, whether from some disorganization, or change in the lungs, or obstruction in the air passages; whatever the obstruction be, it must first be traced to its cause before good can be done. This is sometimes not easy to do; the owner must act with judgment. Thick wind often follows pneumonia, and is caused by closing or obliteration (hepatization) of a portion of the lungs. If it does not pass away after the disease which preceded it is entirely cured, it may be mitigated by feeding the animal on sound oats, entirely freed from dust, giving but little hay, that moistened, and avoiding any food that is dusty. Mashes and carrots in Winter sufficient to keep the bowels properly open, and turning on prairie pasture in Summer will be indicated.

Roaring has rendered nearly useless many valuable horses in England; in the United States horses are not subject to it. It is said to be produced by obstruction in some part of the respiratory canal, most often in the larynx and next in the trachea. Thus chronic cough sometimes terminates in roaring. In this country heaves is the most usual termination.

XII. Broken Wind; Bellows; Heaves.

Causes.—Broken wind is the result both of disease of the lungs and violent exertions. Feeding on dusty hay and grain are prolific sources of the disease. Where no clover hay is used, the disease is rare. It is mainly confined to horses that have arrived at maturity. A horse fed for days and weeks on dusty hay, and then driven hard, will exhibit heaves, unless his lungs and digestion are extraordinary. This disease is usually known in the South under the name of bellows, and in the North as heaves, either of them expressive of the disease.

How to know it.—Broken wind is nearly allied to asthma in man, but is more continuous in its action and less liable to occur in paroxysms. At each breath there will be a two-fold motion of the flank, caused by a falling in of the abdominal walls, causing the flank to lift, then after a perceptible interval a rising of the back part of the belly assists in freeing the lungs of air. There is a short, dry cough, sometimes almost inaudible, followed by whirring. When the horse is moved suddenly, or driven hard, when a draught of cold water is given, or the animal is suddenly brought into the cold air, the spells will occur. Indigestion is almost always present, and as a consequence of flatulency of the bowels. The appetite is ravenous and unnatural; eating the litter given for bedding, is one of the many exhibitions of it.

What to do.—There is no permanent cure for this disability. The symptoms and distress may be alleviated by giving only sound grain and bright, hard stalked hay, free from dust. Prairie hay with plenty of resin leaf in it is the best; next, clean cured corn-stalks. But little water should be allowed at a time, and not more than 6 to 8 pounds of hay, daily, and this given at night, the provender being confined as much as possible to grain and grass in Summer, and grain, bran-mashes and carrots or potatoes in Winter.

This will enable many broken-winded horses to do a fair amount of work with comparative comfort. In any event, a horse inclined to be thick-winded in any degree, should never be tightly checked up, nor above all, be driven by pulling in the head, causing undue bearing either of the curb or snaffle on the jaw.

BIT BEARING UPON JAW.

The animal should be allowed to hold its head in the easiest position, since its work must be necessarily slow. One of the most usual palliative means of the animal appearing for a time sound, is to give 10 to 15 grains of arsenic a day for a week or ten days. A better preparation to give relief—afterwards, the animal to be turned out on clean, short grass, is the following:

No. 77.

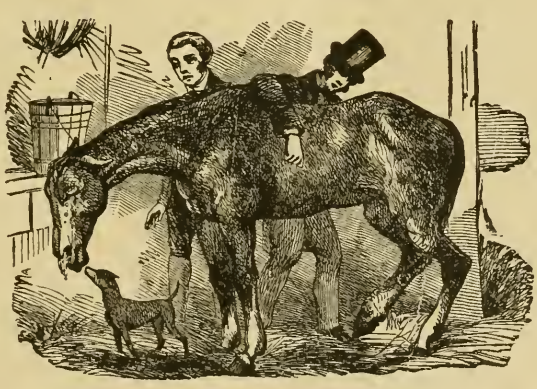
1 Ounce Fowler's solution of arsenic,
1 Drachm extract of belladonna,
½ Drachm tincture of ginger.

Give once a day, in the morning, in one pint of water, and continue for four to eight weeks, as circumstances may dictate.

XIII. Influenza.

This epizootic, which first and last has been prevalent in nearly all countries where the horse is used, is, as to its origin, but little understood. Its symptoms, however, are well known, but these may be complicated by inflammatory symptoms of all the air passages; also by rheumatic swellings, paralysis, delirium and inflammation of the eyes.

How to know it.—The attack may be sudden. There will be stupor and weakness, the head will be held low, the eyes dull and half closed, the gait will be weak, with cracking of the joints sometimes. There will be no appetite, and fever; the mouth hot and clammy, the bowels costive, with scanty urine; the pulse quick and weak, but sometimes hard; the membrane of the nose may be pink, or a deep leaden hue; the cough will be deep and harsh; the coat rough and staring; the skin tender and sometimes trembling, and the ears and limbs alternately hot and cold. Upon applying the ear to the lungs crepitation will be heard, or sometimes a harsh blowing sound. As the disease progresses, and the nose discharges a white, yellowish or greenish water, the animal may get better; but when the lungs are seriously involved, the symptoms will increase. As a rule there is constipation, although purging is sometimes present.



CONFIRMED INFLUENZA.

What to do.—Place the animal in a well littered stall, free from drafts of air Do not depend upon strong physic. The cure must be effected by watching the symptoms and combating them. If there is costiveness keep the bowels open by injections of two wine glasses full of linseed oil. Relief must be had by means of stimulants and tonics. Good nursing must be constant, with clothing enough to keep the animal warm A good tonic and stimulant is:

No. 78
2 Oz of gentian,
2 Oz. carbonate ammonia.

Form in eight doses and give one night and morning. If the cough is distressing prepare the following:

No. 79.
½ Oz. extract belladonna,
2 Drachms powdered opium,
3 Drachms camphor,
2 Oz. liquorice,
½ Pint molasses.

Mix thoroughly and spread a table-spoonful on the tongue twice a day. If, with the cough, there is sore throat and catarrh, prepare the following:

No. 80.
20 Grains iodine,
1 Drachm iodide of potassium,
2 Ounces sweet spirits of niter,
1 Pint water gruel.

Give this as a dose twice a day. If the animal should begin to improve it will be about the fifth day.

Sometimes recovery is complicated by various disabilities. If there is dropsy or swelling of the legs or sheath, prepare the following:

No. 81.
1 Oz. iodide of potassium,
1 Oz. carbonate of ammonia,
1 Oz. powdered gentian.

Form into eight balls and give one morning and evening.

If a spasmodic cough follows the attack the following will be indicated:

No. 82.
1 Drachm extract of belladonna,
1 Drachm chloroform,
10 Drachms alcohol.

Mix in a pint of gruel and let it trickle slowly down the throat, in order to produce a full local effect.

As recovery ensues, the food should be nourishing and easily digested. The animal should be induced to take food during the disease, especially in the form of nourishing gruel. When the pulse changes, and especially when it loses its wiry character; when the discharge from the nose becomes steady and copious, a pint of ale occasionally is a good stimulant. In any event, good, easily digested food should be given, and the animal must be nursed until entirely recovered.

XV. Pink Eye.*

This epidemic has been prevailing throughout the United States. It is a dis-

* From M. W. Birch, V. S., President of the Pennsylvania College of Veterinary Surgeons.

ease which confines itself to no particular organ or organs of the animal economy. The cause is some malignant miasmatic influence.

Symptoms.—The mucous surface of the eyelid assumes a yellow cast; increased redness of the membrane of the nose; oozing of tears and sometimes mucus from the corners of the eyes; snorting, in some cases cough, and sore throat, with or without febrile disorder. I shall divide my subject into four classes: Simple, when void of fever; febrile, when attended by fever; chronic, when of long and tedious duration; influenzal, when attacking many at one time, and accompanied with prostration of strength and loss of condition.

The symptoms of simple are some slight hurried blush of the membrane of the nose; oozing of tears from the corners of the eyes, with globules of mucus observable in them; occasional snorting, perhaps coughing as well, with or without slight soreness of the throat, but without depression of spirit or loss of appetite.

Febrile stage may be either slight or severe. When slight it is nothing more than the simple form accompanied with swelling in one or all the legs, and with dullness and fastidiousness of appetite and some little fever, preceded perhaps by shivering. This is the ordinary form.

The severe form is that in which the depression is greater, the appetite nearly or quite lost, the fever comparatively high, membranes more injected. The duration of an attack of Pink Eye is ordinarily from one week to three. Should it not appear to be on the decline about the third week, we may infer the disease is becoming chronic, in which form it may degenerate into nasal gleet or glanders.

Treatment.—The treatment is a very simple affair. First. Take the horse out of his warm (perhaps foul) stable, or from any cold or wet situation in which he may happen to be, and turn him loose into a box of the temperature of 55 degrees. Take care that he may have an ample bed, clean and dry, and free from all impurities. In cold weather clothe him warmly, and, if required, flannel bandage his legs; give him nothing to eat but sloppy bran-mashes; and, as he probably evinces signs of sore throat, let him have linseed tea or gruel, or chilled water to drink, a pailful of either beverage being hung up within his box, so that he may partake of it at pleasure. Inject by the mouth once a day as follows:

Chlorate of Potash, one ounce;
Warm water, a half gallon.

Let the throat be rubbed with the following liniment:

Water of Ammonia;
Oil of Turpentine;
Oil of Lard; two ounces of each.

Apply the above once a day for three days. Should the excrement prove hard, let an injection of soap and tepid water be given and repeated daily,

until, through it or a mash diet, the bowels become regular. Administer internally F. Ext. Belladonna in 80-drop doses every three hours. If the animal be attacked with fever, discontinue Belladonna and substitute Tr. Aconite in 10-drop doses every hour until eight doses have been given. If the animal becomes debilitated, a stimulant should be given in the form of whisky. Give an ordinary whisky glass full as a dose. If the breathing becomes labored or increased, apply the liniment which is to be used on the throat to both sides of the chest. This should be done but once. Follow this with careful nursing and moderate exercise.

XVI. Bleeding from the Nose.

This often occurs from various injuries to the mucus membrane of the nostrils, from hard pulling up hill, too tight a collar, and from other causes, especially if the animal be full of blood. In these cases, the bleeding is from one nostril and in drops, accompanied by sneezing. If the bleeding comes from the lungs, it will be bright red and frothy, and there will be a cough. If from the stomach, it will be black, clotted, sour and accompanied by retching.

What to do.—In simple cases tie the head up as high as possible, blow strong alum water from a tube into the nostril at each inspiration, and if obstinate, plug the nostril with pledgets of tow. Give internally one scruple of acetate of lead, to be followed in half an hour with another if necessary. In the case of an ox, two scruples may be given at a dose.

If both nostrils are involved, and the flow is continuous, only one nostril must be stopped at a time, unless tracheotomy is performed, since the horse cannot breathe through the mouth. The ox, however, *can* do so, and both nostrils may be plugged if necessary. See Tracheotomy, page 488.

XVII. Strangles.

This is a disease but little known in America. Our distemper takes its place. It is thus described in English works: It usually occurs in young horses, highly-bred horses being more subject to it than cold blooded ones. When the animal is "breeding strangles," there is a general though slight indisposition. After a few days the neck becomes stiff, the throat swells, the tumor being hard, hot and tender. A discharge from the nose takes place, the throat becomes sore, the breathing oppressed, the hair is staring, the appetite is gone, and the animal stands with half-closed eyes. At length the tumor becomes ripe enough and is opened, as is usual in distemper. It is more than probable that the disease is really the same, and that strangles and distemper are one and the same thing, only modified by conditions and climate.

The general treatment is the same as for distemper. See on pages 308–310.

OPENING THE ABSCESS OF STRANGLES.

XVIII. Spasmodic Action of the Glottis and Epiglottis.

This may be occasioned rarely by food sticking in the œsophagus. It is sometimes attendant upon cutting the teeth, in which case the gums should be cut. It generally appears in colts, calves, and lambs.

How to know it.—The first symptoms are like those of sore throat. There will be a dry whirring breathing and a hard metallic cough. Sometimes it will be heard only when spasm of the larynx comes on. As the disease progresses the fever increases, the temperature of the body running to 107 degrees, and the pulse from ninety to over one hundred. White films or pellicles (albuminous false membranes) form in the throat, which come away from time to time, or if not, the animal dies of suffocation.

What to do.—Place the animal where it may have free air but no drafts, and where the temperature may be kept comfortable. Allow sufficient clothing. Give as a laxative twelve ounces Glauber salts dissolved in a quart of warm water.

As an antispasmodic give two or three drachm doses of laudanum every hour in a decoction of marsh mallow. In the early stage of the disease warm fomentations persistently applied may scatter the disease. If later, use the following:

No. 82.
1 Part oil of turpentine,
1 Part lard oil,
1 Part solution of ammonia.

Rub well on the affected parts of the throat. If the membrane in the throat do not give way, and there is increased difficulty in breathing, swab the throat with a solution of: 10 gr. nitrate of silver in 1 oz. of rainwater.

CHAPTER VI.

DISEASES OF THE STOMACH AND BOWELS.

I. SOUR STOMACH. —— II. COLIC. —— III. THE BOT. —— IV. INFLAMMATION AND RUPTURE OF THE COLON. —— V. INFLAMMATION AND BLEEDING OF THE RECTUM. —— VI. SPONTANEOUS SALIVATION. —— VII. INFLAMMATION OF THE STOMACH. —— VIII. SORENESS AND ITCHING OF THE ANUS. —— IX. CHRONIC GASTRITIS. —— X. SPASMS OF THE DIAPHRAGM. —— XI. RUPTURE OF THE STOMACH. —— XII. INFLAMMATION OF THE PERITONEUM. —— XIII. STRANGULATION OF THE INTESTINES. —— XIV. FUNCTIONAL DISEASES OF THE LIVER. —— XV. PARASITES WHICH AFFECT THE LIVER. —— XVI. DIARRHEA.

I. Sour Stomach.

Animals living upon vegetable food, where the mastication or the grinding down of the substances taken into the mouth is imperfectly accomplished, or where a greedy animal is allowed to overload the stomach with food, since it thus is imperfectly moistened with saliva, are subject to acidity of the stomach, fermentation of the food, and the diseases attendant thereupon. Carbonic acid gas is evolved, and if not checked in time will sometimes cause violent and extreme distension and inflammation of the stomach, the result of decomposition, or spasmodic colic, with paroxysms of extreme agony, and sometimes the most violent rupture of the stomach ending in death.

We often see violent distension of the stomach in cattle when turned into a field of flush clover when hungry; the remedy in this case is thrusting a trochar or knife into the stomach to allow the escape of the gases. When in the horse inflammatory action has been set up it may lead to many diseases, each of which must be treated according to the symptoms exhibited.

In the first stage or that of simple acidity of the stomach, if taken in time, treatment is comparatively easy. It is called sour stomach, acute gastritis, indigestion, tympany, etc.

Causes.—Suspended digestion and consequent fermentation from overloading the stomach with improperly chewed food. This will never occur in slow feeders that fully grind and saturate the food with saliva, since in this case the appetite is fully satisfied before overloading ensues. Colic may occur by giving large draughts of water immediately after feeding, thus washing forward the food beyond the stomach. Sour stomach may also ensue from indigestible and easily fermented food, and inflammation from eating plants that irritate the stomach.

How to know it.—The first symptoms are sour stomach, simple colic, or fermentation. There is fullness, causing undue distension, then quickened, deep, but oppressed breathing; the animal is dull and stupid; there is increasing pain, and at length, if relief is not obtained, more violent symptoms set in.

What to do.—Give immediately one or two ounces of magnesia. Evacuate the bowels by means of injections of warm water. Rub the belly with considerable friction one way, from the forelegs back. If there is griping give the following:

No. 85. 15 to 20 Drops oil of peppermint,
1 Ounce of laudanum.

If the weather is cold, blanket and walk the horse to assist in giving relief.

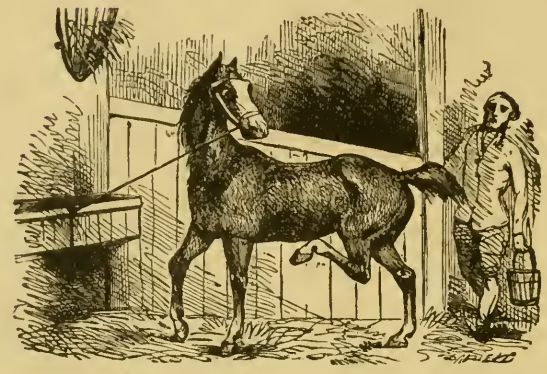
In the case of the ox, give double the dose mentioned; sheep one-quarter to one-third the dose for the horse, except of laudanum, of which give the sheep, 2 to 3 drachms.

II. Colic.

This may be of two kinds, spasmodic, or flatulent colic. The first is the result of cramps or spasmodic contractions, causing severe pain with tendency to inflammation. The other of distension of the bowels with tendency to inflammation and rupture of the coats.

How to know Spasmodic Colic.—There will be spasms of pain, with pawing, striking of the belly with the hind foot, looking round at the flanks, lying down and suddenly getting up, rolling, or lying stretched out for an instant; then suddenly rising, the horse will shake himself as the pain intermits. Again the pain returns and the same performances are gone through. There may be frequent small discharges from the bowels

and bladder, and during the attacks the pulse and breathing are accelerated.



THE FIRST STAGE OF SPASMODIC COLIC.

What to do.—Relieve the pain by means of an opiate, and cause movement of the bowels. To do this in mild cases the following will be good in connection with injections of warm water:

No. 86.

½ to 1 Ounce of laudanum,
4 to 5 Drachms aloes,
1 Pint hot water.

SECOND STAGE OF SPASMODIC COLIC.

Pulverize the aloes and dissolve in the hot water. Cool as quickly as possible and add the laudanum, and give as a dose. If there is abundant formation of gas, give the following promptly:

No 87.

½ Ounce powdered aloes,
1 Ounce aromatic ammonia,
1 Ounce sulphuric ether,
1 Pint warm water.

Mix and give at once. Another colic drench in good repute is the following:

No. 88. 4 Drachms aloes,
1 Ounce sulphuric ether,
1 Ounce laudanum.

THIRD STAGE OF SPASMODIC COLIC.

Mix, pulverize the aloes in a pint and a half of hot water; cool, add the other ingredients and give immediately. If relief is not obtained, give as a second dose the following:

No. 89. ½ Ounce sulphuric ether,
½ Ounce laudanum,
½ Ounce spirits camphor,
½ Ounce essence of peppermint.

Mix in a pint of gruel and turn down. The symptoms in cattle are uneasiness, shuffling of the hind legs when standing. When lying down they will kick with the outer limbs. There will be moaning and twisting of the tail. The same treatment is advised as for the horse, except that one pint of linseed oil should replace the aloes. Give the doses by allowing the liquid to trickle down the throat very slowly. The doses should be double that of the horse. Swine should have castor oil one ounce in place of the linseed oil; and sheep three-quarters of an ounce. Otherwise the doses should be about one-quarter to one-fifth those ordered for the horse.

Flatulent Colic.—This disease is dangerous, and is generally the result of a chronic distension of the bowels, with tendency to inflammation and rupture of the coats.

It may be the result of some other disease, or appear as a consequence of the spasmodic form; or, may be produced by the same causes as those assigned to the acute form.

How to know it.—The expression of pain is constant but not so acute. The pulse is rapid and feeble, with difficult breathing; the feet and ears are cold: the abdomen is tense and swollen, and it sounds drum-like when struck. The animal is weak and sometimes delirious. The intestines are painful (sore) as is shown by the cautious manner of lying down; if, indeed, the horse lies down at all.

FIRST STAGE OF FLATULENT COLIC.

What to do.—Be careful about giving purgatives. Act by injections of soapsuds and oil of turpentine; removing the contents of the impacted rectum with the well oiled hand. Give the following injection:

No. 90. ½ Pint oil of turpentine.
1 Quart of soapsuds.

HORSE DYING OF FLATULENT COLIC.

Repeat in half an hour if necessary. If there is great distension puncture the large intestine, or, where the sound when tapping with the

knuckles is most drum-like, plunge in a trochar and allow the gas to escape through the canula. Give the following according to circumstances:

No. 91. ½ to 1 Ounce laudanum,
2 to 4 Ounces tincture assafœtida.

Mix in a pint of gruel.

If the colic is the result of disease and exhaustion, with much swelling of the belly, try the following:

No. 92. ½ Ounce chlorate of potash,
½ Ounce sulphuric ether,
½ Pint water.

To be given in a half pint of gruel.

Later in this disease when it is required to act moderately on the bowels the following will be found useful:

No. 93. ½ Ounce chlorinated soda,
2 to 3 Drachms aloes.

Powder the aloes and dissolve the whole in a pint of warm water, and give when cool. During recovery, the health of the animal must be attended to. Give easily digested food; avoid large draughts of water, and over feeding. Give good grooming; blanket if necessary, and keep the circulation active by hand rubbing of the body and limbs.

III. The Bot.

The female bot fly, *Æstrus-equi*, is too well known to need description. They lay their eggs on the legs, flanks, and other portions of the horse's body easily reached. The animal in licking its body takes the egg into its mouth and being swallowed they hatch, and the young fasten themselves by means of their hooks to the mucous membrane of the stomach. Here they live and grow and the next season become mature and are passed from the animal, and undergo their transformation to the perfect fly in the earth. So long as the animal is in perfect health they do little if any harm. But in case of disease or insufficient food they become troublesome. Or if they exist in great numbers when nearly or full grown and they are passing from the animal, they sometimes cause severe injury by attaching themselves to the sensitive lining of the bowels. This irritation is not easily distinguished from other forms of indigestion or colic.

In the Spring when the animal is hungry, and there is indication of intestinal difficulty, they may be suspected. If the horse turns up his upper lip, and if the edges of the tongue are red and fiery looking, it

will be evidence of their existence. At this time physic will hasten them away. A usual remedy is to give once a day for three days, 1 drachm sulphate of copper, to be followed at the end of the time with 4 drachms of Barbadoes aloes, and repeat at the end of a week if necessary. Or the following will be found safe and effective:

No. 94. 1 ½ Drachms calomel,
1 ½ Drachms powdered savin,
2 Drachms powdered assafœtida,
30 Drops oil of male shield fern.

Make into a ball with molasses and linseed meal, to be given at night and followed next morning with 4 drachms of aloes.

In the South, Azedarach (pride of China) is grown around stables for its supposed efficacy in destroying bots by being eaten by horses. If so, it can only be while the bots are quite young. Since, after acquiring some age and becoming fastened to the stomach, they resist alike, strong acids, alkalies, irrespirable gases, narcotics and mineral poisons.

Colics, etc., arising from bots, may be treated by anti-spasmodics as given under that head. As a preventive against bots, keep the long hairs of the jaws, breast and fore-limbs trimmed close, and apply a little oil daily; and brush off any eggs that may be found. Animals kept in stables and well groomed are seldom troubled with bots.

ŒSTRUS HEMORRHOIDALIS.

2.—Eggs magnified. 3.—The Bot. 4.—The Crysalis. 5.—The male fly.

Another bot fly (*Œstrus Hemorrhoidalis*) resembles the *œstris equi* quite closely, and deposits its eggs upon the lips and upon the hairs under the jaw. Dropping into the food, they are swallowed and fasten to the stomach in dense clusters. The larvæ are somewhat longer in proportion to their bulk than the species *equi*.

When ready to pass away they sometimes cause irritation of the bowels and anus by sticking there. The same means must be used for this species as for the other.

Intestinal worms.—There are various intestinal worms that inhabit the

horse, at least three species of tape worms and seven of round worms. The ox has two tape worms and seven round worms. The sheep one tape worm and seven round worms. A good vermifuge for tape worm is the following:

No. 95.
¼ Ounce powdered aloes,
¼ Ounce powdered assafœtida,
1 Ounce oil of turpentine,
1 Ounce sulphuric ether.

Mix the two first in hot water and when cold add the turpentine and ether, and give in gruel as a drench. If the animal is weak and out of condition, give an ounce of areca nut, and follow with nourishing food. For round worms, if suspected, give 4 drachms of aloes, and if worms are found in the dung, give immediately on an empty stomach the following:

No. 96.
1 Drachm oil of male fern,
2 Ounces oil of turpentine,
½ Pint linseed oil.

Follow this for three days with a dose of 1-2 drachm sulphate of copper For thread-worms in the rectum give an injection every two days for a week, of the following:

No. 97.
2 Drachms oil of turpentine,
1 Pint linseed oil.

Inject every day for a week, a purgative dose to precede the first injection. A strong decoction of wormwood is also a good vermifuge used as an injection.

IV. Inflammation and Rupture of the Colon.

This disability is usually the result of colic. If through constriction of one part and expansion of another rupture actually occurs, the animal will die. The colon is the largest division of the intestinal canal. Beginning at the *cæcum*, (the commencment of the large intestine) it ascends by the right kidney, passes under the hollow part of the liver to the spleen, thence descends by the left kidney and passes in the form of an S to the upper part of the *os sacrum*. It thence runs straight to the anus and this part of it is called the *rectum*.

How to know Rupture.—The sides of the flanks will be distended, there will be fever and heat, and the animal will give evidence of its severe suffering. The pulse will be hard, wiry and quick, the belly tender, the

ears cold; the pain will be constant, and medicine will increase it. There will be great and rapidly increased weakness. The symptoms are directly opposed to those in colic.

What to do.—In the first stages of the disease give the following, in lime water, every hour or two until three or four doses are given:

No. 98. 20 Drops tincture of aconite,
½ Ounce laudanum.

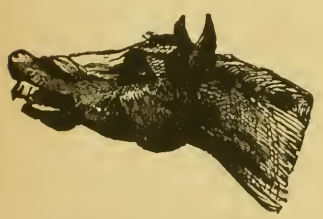
In very severe cases a hypodermic injection of 40 grains of chloral hydrate, to be at once followed by one of 3 grains of morphia, to be repeated in an hour; this, however, must be performed by a competent surgeon. The following may be given by the mouth:

No. 99. 10 Grains morphia,
1 Ounce chloral hydrate.

Give in sweetened water, and repeat every two hours until three or four doses are given, or until the symptoms abate.

Extensive fomentations to the bowels will be beneficial. This may be done by folding a blanket inside a rubber cloth which is fastened over the back. Keep the blanket soaked with water as warm as can be borne.

If the disease be inflammation of the bowels, or enteritis, whether it does or does not follow an attack of colic, among the symptoms will be stretching of the lips upward. This may however be done when there is abdominal irritation of any kind. If the inflammation be severe, so shown by increased heat and fever, an ammoniacal blister may be applied. Dilute strong liquor of ammonia with six times its bulk of cold water, saturate a cloth with it and lay it on several folds of blanket, to be held to the belly by four men who will not mind the fumes. The manner of holding it is shown in the cut on next page.



NOSE STRAINED UPWARD.

Watch the action of the ammonia. It may blister within ten minutes, or it may take twice that time. Do not allow it to eat the skin, else a bad sore will be the result. When the proper effect is produced remove it at once. It should really be applied only under the direction of a veterinary surgeon. They are, unfortunately, not always near. In this case, to save life, something must be risked. The worst inflammatory symptoms being stayed, give every two hours until three or four doses are given, or a favorable result is obtained, the following:

No. 100. 30 Grains calomel,
1 Ounce laudanum.

Mix in half a pint of gruel. As the animal begins to take food it should have bran and oatmeal mashes, mixed with tea of slippery elm bark. Cooked food should be given, and if carrots are at hand, give a mess of them boiled every day. Skimmed milk is excellent if the animal will drink it.

APPLICATION OF AN AMMONIACAL BLISTER.

V. Inflammation and Bleeding of the Rectum.

This is a difficulty that often accompanies or follows inflammation of the bowels.

How to know it.—There will be heat and swelling, with or without protrusion and bleeding of the rectum.

What to do.—Wash the parts with a weak solution of salt and water, and also use injections of the same as often as may seem necessary. If this do not give relief add a slight infusion of chlorate of potash and golden seal.

VI. Spontaneous Salivation.

Causes.—This infirmity is generally the result of or symptom of some other affliction. It is often produced by something the animal has eaten. White clover will produce it. Caries and other diseases of the teeth: dentition, paralysis of the lips, ulcers of the mouth, irritating food, irritation by the bit, and especially from medicaments attached to the bits of horses by ignorant stable men. It occurs as a free discharge of saliva in frothy masses or in stringy filaments, with frequent swallowing, thirst, and generally indigestion.

What to do—Remove the cause. If the cause is from alkalies, wash the mouth with weak vinegar. If from acids, use lime water. If from

caustic salts, use white of egg, or tea of slippery elm bark. If there is inflammation with costiveness, open the bowels with injections of warm water, or soapsuds, and wash the mouth frequently with vinegar and honey. If this do not effect a cure wash the mouth with alum water. If there are ulcers touch them with a feather wet with the following:

No. 101. 10 Grains lunar caustic,
1 Ounce distilled water.

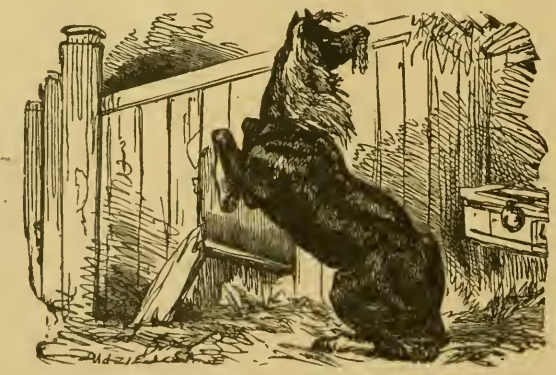
If there are tumors with pus, lance them. If there is sloughing wash with the following:

No. 102. 1 Drachm solution of permanganate of potassa,
1 Pint rainwater.

Give plenty of cool water, so the animal may take it at will, and feed with soft or boiled food, and if there is much swelling, keep the head tied up.

VII. Inflammation of the Stomach.

Causes.—This disease is not common in horses, and occurs rarely from eating vegetable poisons, and more generally from poisoning by arsenic given in the food by ignorant stable-men, to make the horse carry a shining coat and foam at the bit. It is also produced by the licking of external corrosive applications, thus producing acute gastritis.



HORSE SUFFERING FROM ACUTE GASTRITIS.

The symptoms are various in unison with the causes producing them. These are, refusing food, extreme thirst, redness of the nasal and conjunctival membranes, discharge of ropy saliva, frequent eructations with fetid smell, colic, rolling on the ground, pawing, striking at the abdomen, etc.; tucked up flanks, heaving, panting, small, quick pulse, violent

straining, passing of mucus in large quantities, protrusion and inflammation of the opening, glances at the abdomen, prostration of strength, convulsions, madness and death.

What to do.—The first thing, if possible, is to find out what caused the trouble. If this cannot be found, give at once:

No. 103. 3 Ounces sulphuric ether,
3 Ounces laudanum,
4 Ounces carbonate of magnesia,
1 Quart cold gruel.

Mix and give as a dose. If the pulse be low, add to the above one drachm carbonate of ammonia. If the animal is weak, but able to swallow, take plenty of time, do not use violent means. If there is paralysis of the throat, or the horse is in delirium, the dose must be injected through the nostril, by means of a pump and pipe, or horse catheter. See article tetanus. As soon as there is evidence of recovery, and in fact whenever the animal will take it, thin starch or gruel of flour should be freely given to sheath the mucus surfaces.

VIII. Soreness and Itching of the Anus.

This is a disease following inflammation and disease of the rectum, and also produced by other causes. The anus or orifice of the rectum becomes sore. There is a peculiar dryness with scurf, and to relieve the itching the horse sometimes rubs the roots of his tail until the hair is entirely worn away.

What to do.—Attend to the general health of the horse, to keep the bowels in a natural condition. Mix a little fine salt with lard oil, and keep the parts well oiled, with friction. If the trouble be inside, a little goldenseal well rubbed down with salt butter and passed carefully within the anus, will give relief. If the difficulty is occasioned by worms, see that article.

IX. Chronic Gastritis.

Causes.—Anything which impairs the digestive functions may produce this disease. It is, however, in its chronic form, extremely rare. The ordinary food will be refused, and the animal will persist in eating foreign substances—old lime mortar, the wood work of the stable, earth, litter and bedding.

How to know it.—There is a dry cough; the membrane of the mouth and nostrils are dry and pale; the breath is tainted; the evacuations

smell badly; the eyes are sunk, the coat dry and ragged; the horse loses condition and becomes pot bellied; the anus is lax and prominent.

What to do.—The cure will take time. Prevent the animal from indulging its unnatural appetite. The following made into a ball will be indicated.

No. 104.
½ Grain strychnia,
1 Drachm bichromate of ammonia,
¼ Drachm extract of belladonna,
1 Drachm powdered gentian,
½ Drachm sulphate of zinc.

Give this as a ball once a day. If after continuing several days there is no improvement, give the following:

No. 105.
½ Ounce liquor arsenicalis,
½ Ounce tincture ipecac,
1 Ounce muriated tincture of iron,
½ Ounce laudanum,
1 Pint of water.

As the animal gets stronger give an ounce of sulphuric ether daily in a pint of water.

If the animal has simply chronic indigestion, that is, the disease does not show in the severe form we have depicted, to improve the general health the following will be indicated:

No. 106.
1 Ounce powdered assafœtida,
1 Ounce powdered golden seal,
2 Ounces powdered ginger,
2 Ounces powdered poplar bark,
5 Drachms powdered sulphate of iron,
1 Drachm powdered red pepper,
1 Pound of oatmeal,

Mix, divide into sixteen messes, and give one every night in the food. In addition to this the following will make a good appetizer:

No. 107.
1 Quart brandy,
1 Ounce salt.

Mix and give a wine glass full night and morning in gruel, just before the food. The food given must be of the very best, and that which is easily digested. Boiled oats, shorts and carrots, with sufficient good hay to distend the stomach. Keep the animal muzzled during the intervals of feeding, to prevent foul feeding. That is, eating litter or other injurious substances. If acidity of the stomach be shown, moisten the hay given, and sprinkle it freely with magnesia.

X. Spasm of the Diaphragm.

Causes.—Hard riding or driving of a horse constitutionally weak.

How to know it.—If the horse is being ridden, there will be a sensation to the rider as though a sudden blow was given inside the horse. This is from spasmodic action of the diaphragm (the midriff or muscle separating the chest from the abdomen) in drawing the breath. If the animal is still driven forward it sometimes suddenly falls and dies of suffocation.

What to do.—There is no cure. Relief may be given by clothing the animal. Lead him to the nearest stable or shed and give the following:

No. 108.
3 Drachms aromatic spirits of ammonia,
3 Drachms tincture of ginger
3 Ounces laudanum,
1½ Ounces ether.

Mix in a pint of oil or gruel and give as a drench, or give the following:

No. 109.
½ Drachm camphor,
1 Drachm powdered ginger,
1 Drachm carbonate of ammonia.

Mix with sufficient linseed meal and hot water to form a ball. Repeat at an interval of three hours if relief is not afforded by the first dose.

A horse subject to this affection should have only slow work. The diaphragm may be strengthened by giving for some time a daily dose of one drachm of powdered sulphate of iron in the food.

XI. Rupture of the Stomach.

Rupture, when it ensues, ends pretty surely in death. Rupture of the stomach is produced by working or driving a horse until he is very hungry and then feeding and watering unduly. The only symptoms which show, are violent colic, and the tenseness of the tissues. There are many ruptures where animals die, and the owner does not know what is the difficulty. If the mischief has proceeded to rupture, the animal may as well be killed.

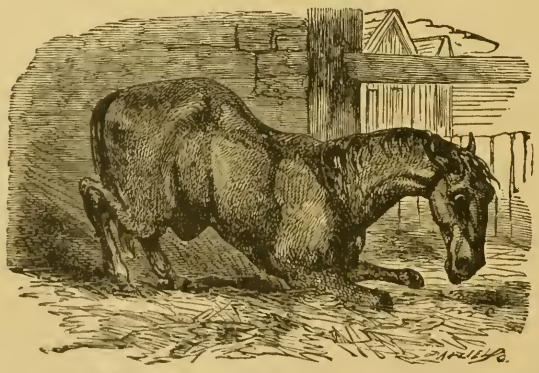
One of the positions assumed by a horse suffering from abdominal injuries, is this: He will persistently sit on his haunches. Animals will assume this position and yet occasionally recover. Another position assumed is, for the animal to kneel and support himself upon his hind

legs. Such unnatural positions show the intense pain which leads to such attitudes to get relief.

UNNATURAL ATTITUDE INDICATIVE OF ABDOMINAL INJURY.

XII. Gorged Stomach.

When this occurs from over feeding, the bowels should be immediately relieved by removing the contents by repeated injections of warm water. Let the animal be gently walked about, and warmly clothed in cold weather. The operator must act according to circumstances. If discov-



POSITION ASSUMED BY HORSE SUFFERING FROM ABDOMINAL INJURY.

ered early, or before colic sets in, give the following to evacuate the bowels after having relieved them by injections:

No. 110.

6 Drachms powdered aloes,
1 Ounce sirup of buckthorn,
1 Ounce tincture of ginger.

Dissolve the aloes in a pint of warm water, add the buckthorn and ginger, and give as a drench.

XIII. Inflammation of the Peritoneum.

Inflammation of the lining membrane of the abdomen is likely to occur in all domestic animals. In ruminants the right side is most affected, and the animal will stand with its feet well together.

Causes.—Injuries either from rupture of the stomach or intestines, or from injuries to the abdominal walls, exposure to chill or cold, or giving an exhausted horse a wet bed to lie on.

How to know it.—There may be colic, or steady pain. This will be acute when the affected parts are pressed. There may be chill and fever alternately, and loss of appetite. The pulse will be rapid and hard, and the breath quick and catching, but when effusion takes place the breathing will be deep and easier; the pulse will soften, the belly will be pendent, and there will be fluctuations when handled, from the water contained.

What to do.—In the early stages, give full doses of laudanum; 1 to 2 ounces, as may be needed, to allay pain and keep the bowels inactive. Apply mustard poultices to the abdomen, or in extreme cases the ammoniacal blister as previously described. Frequent injections of thoroughly cooked gruel may be thrown into the rectum, but until the worst symptoms are past the animal should take nothing into the stomach. As the disease progresses favorably, great care should be exercised in feeding. Oat or rye meal gruel may first be given. If these agree well, give warm soft bran-mashes, with a little oat meal added, and at length hay and sound oats.

In case absorption of the effusion of water in the cavity does not take place, which may be known by regular and ample staling, give 6 drachms potassa nitrate, daily, until the kidneys act. If tonics seem to be demanded, give daily doses of 1-2 drachm oxide of iron.

XIV. Strangulation of the Intestines.

This is produced by various causes, the result of colic and rupture being the most frequent. Strangulation may be produced by the formation of false membranes, by the involvent of the intestines, by the rupture of the mesentary, or by the rolling on itself of the intestine until it is entirely strangulated. In this as in other abdominal difficulties, the animal will often assume unnatural positions, as shown in the article Rupture of the Stomach. If it be a ruminant, and in good flesh, it is better to kill the animal at once. Some forms of strangulation in cattle

of sufficient value, may be remedied by a veterinary surgeon. In this case, give laudanum in 2-ounce doses to keep the animal quiet until the doctor arrives. Relief is obtained by cutting into the side and releasing the intestine. For the horse give opium in one or two drachm doses as the nature of the case may seem to require to relieve the pain, and trust to nature to effect a cure by releasing the parts naturally.

XV. Functional Diseases of the Liver.

The liver of the horse is not particularly subject to disease. It was formerly supposed to be almost entirely exempt, but later researches show it to be an agent, through obstruction, and the principal local seat of various disorders, as diabetes, blood poisoning from imperfect oxygenation of the albuminoids, etc.

How to know it.—In active congestions of the liver, which is the disease most usually prevalent and this principally in the South, there may be sluggishness, irregular bowels, abundant liquid discharges of deep yellow or orange colored dung. There will be extreme and painful prostration, the eyes will be sunken, the pulse excited, and the limbs will tremble. There may be colicky pains. If the last ribs are struck with some force, extreme pain will be shown. If the horse faints and there are pallid mucus membrane, with quick and weak pulse, it may be conjectured that rupture of the liver has taken place. In this case, the end is death. The illustration we give will show the test alike for ruptured liver and spleen.

TEST OF HEMORRHAGE FROM THE LIVER.

What to do.—In the beginning, that is when the pulse is strong, free bleeding will often check the disease. When the pulse is weak, blood must not be drawn; or, if the blood does not flow freely, close the orifice at once.

Apply mustard poultices to the limbs. Give one pound of sulphate of soda dissolved in a quart of water, to deplete the portal system and liver. Apply ice to the last ribs to check effusion. Apply a blister over the region of the liver. Continue the sulphate of soda in doses of one to four ounces daily.

During the attack and recovery the animal must have pure air, and

soft, easily digested food, and as recovery ensues, daily moderate exercise must be given.

Inflammation of the liver is rare. If congestion has proceeded to inflammation the region of the last rib will be very tender. There will be quickening of the pulse. The mouth will be hot and clammy; the bowels may be at first loose, yellow and bilious, but soon become costive. The heat of the body is raised; patches may appear on the mucous membranes; and the limbs, especially the hind ones, will swell.

What to do.—In this case all bleeding should be avoided. Give as a purge a pound of sulphate of soda (glauber salts) aided by injections of warm water. After the bowels are opened, keep them so with small doses of glauber salts, six ounces, or, cream of tartar four ounces daily. If the horse eat anything it must be very light mashes, pulped roots or fresh grass. As the horse improves, give twice a day two ounces of Peruvian bark or two drachms twice a day of gentian.

XVI. Parasites which Infest the Intestines.

The general symptoms for intestinal worms, in large quantity, are general ill health. The animal will lose condition: the skin will be scurfy, dry and often itching; the animal will become hide bound and pot bellied; the appetite will be irregular but voracious; there will be fetid breath, diarrhea, passing of mucus with the dung, colicky pains, swelling, itching and puffy anus, and especially the passage of the worms or their eggs will be certain proof. The horse will raise the upper lip and rub it against anything near. Colts will pick and bite the hair from the body and limbs. The annexed cut will give a good general idea of an animal suffering from worms.

COLT PICKING HAIR FROM ITS LEG, GIVING PROOF OF WORMS.

Besides the bot, already treated of, which inhabits the stomach, there are those of the intestines proper. These are the tape worm, round headed and flat headed, and five species of round worms.

What to do.—Vermifuges are without number, some general in their nature, and others specific for particular classes. When worms are suspected, and the owner of the animal is not sure of the reality, it is safe

to give a purge and watch the droppings. The following is a good vermifuge drench:

No. 111. 4 Drachms aloes,
1 Ounce powdered male fern,
20 Drops oil of worm seed.

Give this in a pint of warm gruel an hour before feeding in the morning.

If it be found that there are tape worms, if the horse is weak, give an ounce of areca nut fasting and follow with 4 drachms of aloes. If the animal is strong, give an ounce of oil of turpentine in an ounce of water. In four hours give another dose and follow in an hour with 4 drachms aloes. In the case of common pin worms, (*Sclerostomum Equinum*) and all worms inhabiting the bowels except the tape worm, the following vermifuge will act kindly:

No. 112. 1 Drachm tartar emetic,
½ Drachm powdered ginger.

Mix with enough linseed meal to form a ball, then moisten with hot water and give a dose daily for a week, before feeding. Follow with a dose of one pint of linseed oil, wait another week, and repeat as before. Then give good generous diet, with tonics daily, say 2 drachms sulphate of iron, or 4 drachms gentian in the food.

For worms lodging in the gut near the rectum, give an injection of a strong decoction of wormwood or tansey. The prevention of worms is to pay attention to the water the animal drinks, to be careful of dog's droppings in the pasture, and to give sound grain and hay as food, since liberal feeding and good general care will often extirpate the parasites. For other vermifuges see article 3 of this chapter.

XVII. Diarrhea.

Diarrhea is a condition of frequent watery discharges from the bowels, and may be produced by so many causes, as irritating and indigestible food, worms, severe purgation by medicines, disorders of the liver, or constitutional tendency, that no general rule can be given. The owner of the animal must find the cause before proceeding intelligently to give relief. The most we can do is to give some general indications.

Sometimes diarrhœa is an effort of nature to rid the body of injurious matter; then the effort should be aided. Early in the effort give the horse a pint of linseed oil, or if an active purge be required, a pint of castor oil. If the diarrhœa does not cease check it with ounce doses of laudanum and follow with tea of slippery elm bark, or linseed. If the

difficulty refuse to give way, doses of 2 scruples of tannin may be given, or, doses of 3 drachms of catechu every hour until checked. The ox requires double the dose. Follow with tonics, say 4 drachms of gentian daily, or one ounce of peruvian bark, with sound, easily digested food. If caused by bad water, throw a handful of charcoal in the water before giving it to drink. The following will be found beneficial in the several cases mentioned.

For sour and fetid discharges mix the following ingredients in the food twice or thrice daily.

No. 113.
1 Ounce powdered chalk,
1 Ounce bisulphate of soda.

For sour discharges with griping, take:

No. 114.
1 Drachm powdered opium,
1 Drachm powdered chalk,
20 Drops carbolic acid.

Form into a ball with linseed meal and molasses.

If the bowels are simply in an irritable, relaxed condition, use the following:

No. 115.
1 Ounce powdered chalk,
1 Ounce catechu,
1 Ounce ginger,
1 Drachm opium.

Make into a ball with linseed meal and molasses.

When the diarrhœa is the result of violent medical purging, try the following:

No. 116.
2 Ounces laudanum,
2 Ounces powdered chalk.

Mix, and give in a quart of thin starch, or flour gruel. For excessive and continued purging, give at one dose the following:

No. 117.
1 Ounce laudanum,
1 Ounce sulphuric ether,
20 Grains tannic acid.
Mix in a pint of flax-seed tea.

Astringent injections may be given as follows:

No. 118.
2 Ounces laudanum,
2 Drachms acetate of lead,
1 Quart starch water.

Inject half of this and follow with the remainder in three hours, if necessary, or give at one injection the following:

No. 119. 4 Drachms tannic acid,
1 Pint starch water.

In case of cattle the same quantities may be used, but when given by the mouth it must be made to trickle slowly down the throat.

CHAPTER VII.

DISEASES OF THE LIVER, URINARY ORGANS, ETC.

I. JAUNDICE. —— II. ENLARGEMENT OF THE SPLEEN. —— III. INFLAMMATION OF THE KIDNEYS. —— IV. PROFUSE STALING, OR DIABETES. —— V. BLOODY URINE, OR HÆMATURIA. —— VI. THICK AND ALBUMINOUS URINE. —— VII. WHITE, OR LIME URINE. —— VIII. GRAVEL, OR STONE IN THE BLADDER. —— IX. SUPPRESSION OF URINE. —— X. INFLAMMATION OF THE BLADDER. —— XI. FOUL SHEATH. —— XII. RUPTURE OF THE BLADDER. —— XIII. SPASM OF THE URETHRA. —— XIV. INFLAMMATION OF THE ORGANS OF GENERATION.

I. Jaundice.

The horse is subject to but few diseases of the liver. Jaundice or the yellows, is a condition in which the visible mucous membranes, the skin (if it be naturally white) the urine and the tissues are stained yellow, not by non-secretion of the bile from the blood, but by the re-absorption of bile already secreted.

Causes.—Obstruction of the bile duct from any cause. Obstruction of the bowels hindering the proper discharge of the bile. Diminished fullness of the capillary vessels of the liver from obstruction of the hepatic artery or aorta. And from undue secretion of the bile in cases of congestion of the liver.

In solid hoofed animals the blood is easily dissolved. In flesh-eating animals it is not so. Hence, although there is often a jaundiced appearance of the membranes in horses, it is comparatively harmless.

How to know it.—There will be a general coloration of the tissues. The mucous membrane will be yellow. The urine will be yellow. In obstruction of the bile duct the dung will be fetid, and of a clay color from being devoid of bile.

What to do.—No general rule can be laid down. The following is a good remedy for torpidity of the liver, when there is general dullness and biliousness.

120. 1 Pound Epsom salts,
1 Pound Glauber salts,
1 Pound common salt,
1 Ounce essence of ginger,
1 Gallon warm water.

Mix and give a pint from one to three times a day until a gentle but full purgation is produced. Follow this up with daily doses of one scruple of podophyllin.

This remedy will also be indicated for cattle, except that they should have the following formula as a purge instead of No. 120:

No. 121. ½ Pound sulphate of magnesia,
½ Pound common salt,
2 Ounces powdered ginger.

Give this dose in two quarts of water once a day until a free evacuation of the bowels is produced, giving also daily one scruple of podophyllin.

Saline purges do not always act kindly on horses. If so the following will be indicated if there is considerable congestion:

No. 122. 30 Grains calomel,
1 Drachm aloes,
2 Drachms soap,
4 Drachms powdered rhubarb.

Mix with molasses into a ball and give twice a day until a moderate operation of the bowels is had.

If the disease occurs in the Spring, turning upon succulent grass, especially where dandelion is plenty, will generally effect a cure.

II. Enlargement of the Spleen.

The pancreas and the spleen are subject to a variety of diseases, very difficult to determine. The pancreas is a gland which secretes the pancreatic juice, by which emulsion takes place with the fatty aliments by means of a duct leading into the intestines. The presence of fatty matter in the dung will imply a suppression of these juices. If there are sharp, colicky pains without fever, obstruction of the duct by calculi may be suspected. If there is general fever, with pain and tenderness behind the last rib on the right side, inflammation may be suspected.

For calculi use fomentations of hot water over the parts affected, and

give anti-spasmodics, chloral hydrate in half ounce doses daily, or hyoscyamus extract two drachm doses, or belladonna two drachm doses, as the case may be.

If there is inflammation give laxative medicines, one and a half ounces dandelion; blister the right side, and confine the animal to light diet.

For suppressed secretion give one ounce doses of sulphuric ether.

So far as affections of the spleen are concerned, it is an involvent in diseases of the liver and other glands. In highly fed animals enlargement ensues; in badly fed ones degeneration or wasting. Obstructed circulation through the liver will engorge the spleen almost to rupture sometimes. In tuberculosis, cancer, glanders and blood poisoning it is affected. Anthrax and other fevers tend to enlargement of the spleen, sometimes to rupture. So little is really known of the spleen and its true functions, that but little can be done except by giving general attention to the health and by means of tonics and good nursing to build up the health.

III. Inflammation of the Kidneys.

SYMPTOMS ATTENDING DISEASES OF THE URINARY ORGANS.

Causes.—Inflammation of the kidneys, Nephritis, is produced by a variety of causes. Blows on, or sprains in the region of the loins, calculi, the excessive use of diuretics to which some stablemen are prone, musty fodder, or that which contains irritant plants, etc.

How to know it.—There will be more or less fever, sometimes a high fever; colicky pains; looking at the abdomen; the horse will lie down with extreme caution; frequent passages of urine in small quantity, but

very high colored, sometimes containing blood and even pus; the legs swell uniformly from the hoofs up; the pulse is rapid, the bowels costive and the breathing excited; the horse straddles in his gait; this, however, is a general characteristic of all diseases of the urinary organs, but in severe inflammation it amounts almost to helplessness.

There is, however, one test that is constant: there is extreme tenderness of the bony processes about six inches from the spine in the loins, pressure over the kidneys will show the terrible pain from the crouching attitude the horse assumes.

TEST FOR INFLAMMATION OF THE KIDNEYS.

If the urine is examined under a microscope, the fibrinous casts of the kidney tubes will be found. In chronic cases, stocking of the legs, casts in the urine, more or less tenderness upon pressure of the loins, and general ill health, may be all that will be observed.

What to do.—In acute cases, if there is a strong pulse and the animal is full of blood, bleeding may assist a cure. It is not always safe, except under the advice of a veterinarian of modern practice. Bleeding should never be practiced except in the earliest symptoms. Give an active cathartic.

No. 123. 1 Drachm calomel,
4 Drachms powdered aloes,
Make into a ball with linseed meal and molasses.

Wrap the loins in woolen blankets and foment thoroughly with an infusion of a handful of digitalis leaves in a pail of boiling water, putting it on as warm as the hand will bear it; or wring a sheep skin out of hot water and apply the flesh side, changing as often as may be necessary.

To assist the evacuation and ease the pain give injections of linseed tea, one quart, to which an ounce of laudanum is added. Get up a good sweat if possible. This will relieve the kidneys. Keep the bowels gently open with laxatives and relieve the pains with anodynes, and as the animal improves, give bitter tonics, 3 ounces of Peruvian bark daily in three doses; or an ounce of gentian in two drachm doses three times a day.

IV. Profuse Staling, or Diabetes.

This disease, called by various names, as diuresis, diabetes insipidus, poluria, etc., is simply an excessive secretion of urine, causing loss of flesh, weakness, and at length terminating in exhaustion and a general breaking down of the system.

Causes.—The most common cause is dosing with quack medicines, a favorite pastime of ignorant stablemen, especially for "the water." It is also produced by musty hay and grain, new oats, distillery slops, acid diuretic plants, or any cause irritating the stomach and at the same time stimulating the kidneys.

How to know it.—There is excessive thirst, profuse and frequent staling, of pale colored urine, thin, and with little odor; loss of condition and spirits; the appetite fails; the skin is hard and dry; the hair harsh; the pulse will be weak, whether fast or slow; depraved appetite for licking noxious substances.

What to do.—Change the food at once, well seasoned hay and grain, with linseed tea given freely in the drink. The horse must not suffer from thirst, but inordinate drinking should not be allowed. Iodine is one of the chief specifics in this disease. The following will be a good formula, to be given three times a day in water:

No. 124. 20 Grains iodine,
1 Drachm iodide of potassium,
4 Drachms carbonate of soda.
Mix, and give in water.

Or, give daily the following:

No 126. 2 Drachms phosphate of iron,
2 Drachms iodide of potassium,
4 Drachms Peruvian bark.
Mix, and give once a day in water.

If this does not soon show a disposition to check the disease, add 15 to 20 grains of creosote daily.

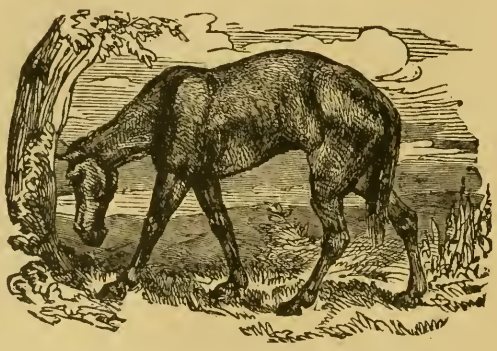
Another good formula, to be given once a day, or in bad cases twice daily, is the following:

No. 126. 30 Grains iodine,
2 Drachms sulphate of iron,
½ Ounce powdered gentian.

Give as a ball, made with molasses and linseed meal. If four or five doses do not show decided effect discontinue. Six or seven days should effect a cure.

V. Bloody Urine, or Hæmaturia.

Causes.—Sprains or bruising of the loins, stone in the kidneys, urinary passages or bladder; blood poisoning.



HORSE SUFFERING FROM BLOODY URINE.

How to Determine the Condition.—If from local irritation, the blood being in a healthy state, there will be clots of blood passed, and fibricious casts of the urinary tubes entangling blood globules. These may be seen with a good lens. If there is gravel more or less gritty matter will be passed. If from blood poisoning, the tests must be made by a veterinary surgeon, from the urine, who can then prescribe the proper treatment.

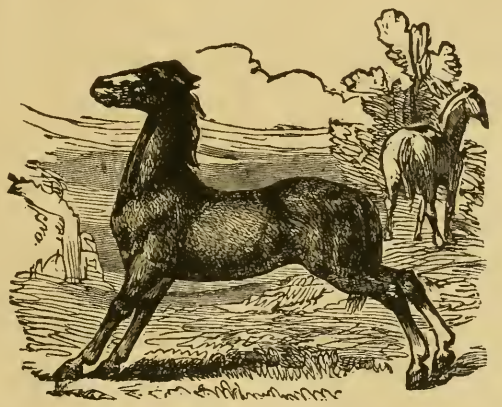
What to do.—The general practice is to give sound food, good shelter, mucilaginous drinks, as linseed or slippery elm tea, or marsh mallow tea. Also acid astringents, vinegar, buttermilk, a weak decoction of white oak bark. If the passages are profuse apply cold water to the loins. If there is inflammation foment with warm water (cloths saturated with hot water) and follow with a mustard plaster. If the bowels are inactive, give the following:

No. 127. 4 Drachms aloes,
1 Ounce cream tartar.

Mix in one and a half pints of warm water and give when cool, aiding the operation by an injection of one quart of soap suds and four ounces oil of turpentine.

VI. Thick and Albuminous Urine.

This disability in horses, characterized by a thick, ropy, albuminous discharge of urine, is quite common in its milder forms, being an attendant on extensive inflammation of important organs, on rheumatism, fevers, and some conditions of blood poisoning. It is especially attendant on inflammation of the kidneys, both acute and chronic, attended with degeneration and shedding of the epithelium (the layers of cells) lining the kidney tubes.



POSITION ASSUMED BY HORSE HAVING ALBUMINOUS URINE.

How to know it.—There are two special positions assumed by horses suffering from severe secretion of albuminous urine. One is the stretched out position. In the other the back will be roached, as seen in the cut. In its mild stages the urine is thick, ropy, mucilaginous; when it first begins to flow, of a reddish-brown color, but changing to a more natural condition, ending with a whitish, milky fluid; sometimes the reverse; commencing white. When the disease is farther advanced the urine is thicker, more deeply tinged, and sometimes offensive to the sense of smell. It may degenerate into a number of forms, and finally terminate in Bright's disease of the kidneys.

What to do.—Place the animal where it may be comfortable; clothe warmly. If there is inflammation of the kidneys, foment with a sheep skin wrung out of hot water; or better, with an infusion of a handful of digitalis (Foxglove) in a pail of scalding water, and use other measures recommended in this article. If it be thought necessary to liquify the urine, not always beneficial, prepare the recipe given on the following page, and exercise great care in the attendant treatment as there prescribed.

No. 128. 1 Ounce powdered assafœtida,
2 Ounces powdered juniper berries,
8 Ounces powdered poplar bark.

Mix, divide into eight parts, and give one night and morning in the food.

The real animus should be to remove the cause, which, as we have stated, is various. Attend to the general health of the animal, keep the bowels open by a free use of bran mashes and other food of an opening nature. Give a laxative if necessary—say, 5 ounces salts, and Peruvian bark 1 to 2 ounces daily at two or three doses.

VII. White, or Lime Urine.

The urine is one of the agents used by nature to pass away the excess of calcareous or other stony matter from the body. So long as the conditions are normal, even when limy secretions are excessive, it may be nature's means of removing this excess. When the urine becomes albuminous, the calciferous matter unites with the albumen, and the result is calculi.

How to know it.—A white matter will be passed at the end of each urination, or the urine may become decidedly limey.

What to do.—Attend to the general health of the horse, give none but sound oats and Indian corn, and sweet clean hay from upland meadows.

Sand-like Deposit in the Bladder.—Sometimes a sand-like deposit, or soft magma is made in the bladder, and to such an extent that the urine flows involuntarily and constantly by drops. The remedy is by means of a stomach pump and catheter, to fill the bladder with water. Shake up the contents with the hand introduced through the rectum, and allow the water to flow through the catheter. So proceed to again pump full and empty until all the deposit is cleaned.

When an animal is inclined to this disability, 1 drachm of caustic soda given daily in the water will correct the secretion.

VIII. Gravel, or Stone in the Bladder.

The existence of urinary calculi, whenever found, is due to the deposit of mineral matter around some body as a nucleus. This may consist of mucus, fibrine, blood-clot, or even of a crystal deposited from oversaturated urine.

Causes.—They are so various that it would be useless to enumerate them. Impaired breathing, whether from weak or diseased lungs, imperfect action of the liver, or impaired functions generally, are among the

prominent causes. Any cause favoring concentration of urine might bring about the formation of calculi.

How to know it.—Cistus calculus, or stone in the bladder, occurs in all domestic animals, producing straining in the effort to pass the urine. It will escape in driblets, often drop by drop, or not at all. Blood will often be passed in clots, and crystals of microscopic calculi will be passed. By introducing the oiled hand into the rectum up to the bladder the stone may be felt. Sometimes there are a number of them.

What to do.—In the case of a female the stone may be broken with a lithatrite. In the case of a male the operation is called lithotomy. The male is operated on standing, or else thrown on the right side. The operation must in any event be performed by a competent surgeon, since it involves cutting and the use of instruments that may not be attempted by the novice.

Preventive Measures.—The seed of Jamestown weed, or thorn apple (*Datura stramonium*) has been given with good effect in preventing the formation of large calculi. Give an ounce of the powdered seed in the feed every other day until six doses are given. In connection with this give the following:

No. 129.
1 Ounce oil of juniper,
1 Ounce oil of sassafras,
4 Ounces sweet spirits of niter.

Form into four doses and give one morning and night for two days. Animals predisposed to gravel should be fed on sound hay from old meadows, sound grain, and watered only with soft water.

IX. Suppression of Urine.

Causes.—Retention or suppression of urine is due to so many causes, especially in old horses, as paralysis of the bladder, meningitis, lockjaw, severe colic or other acute disease, or from irritating drugs given by ignorant stablemen, that the operator must be informed as to the nature of the case.

What to do—If it be caused by paralysis the urine must be drawn off several times a day with a catheter. The following will be indicated to be given internally:

No. 130.
½ Drachm extract nux vomica,
1 Pint water.

Give as a drench twice a day.

Another remedy, if one has a hypodermic syringe, would be:

No. 131. 4 Drops sulphuric acid,
2 Grains strychnine,
½ Ounce alcohol.

Throw one-half of one grain twice daily under the skin.

If the difficulty is due to general weakness of the bladder, give the following stimulant:

No. 132. 20 Grains powdered cantharides,
1 Drachm powdered digitalis.

Make into a ball with soap.

If there is an accumulation of hard fæces in the rectum it must be removed by full injections of strong soap suds, and if necessary removal of the partially softened dung with the oiled hand.

If there is inflammation of the neck of the bladder, as shown by heat, swelling, tenderness, give injections of one drachm extract of belladonna in a quart of warm water, thrown repeatedly into the rectum of horses and into the vagina of mares. To relieve pain give from one-half to two drachms of opium as may be needed.

X. Inflammation of the Bladder.

Causes.—A disease very rare in animals, and when occurring the effect of violent external injury, or the result of irritating medicines, as croton oil, cantharides, administered by the ignorant. It is quite rare, and may be known by the frequent passing of urine, with great pain and difficulty. As a sure test grasp the horse by the mane half way between the head and shoulder with the left hand; place the right hand under the flank when all nervousness is passed, press more or less strongly on the abdomen. If inflammation be present the animal evinces intense pain. If the muscles be tense and hard there is no inflammation.

What to do.—Give full doses of opium, two drachms, to relieve pain. Give linseed tea, milk, and white of eggs beaten up with water as drinks. As a laxative to relieve the bowels give one to two pints of olive oil as may be needed. Inject into the bladder the following if you have an instrument:

No. 133. 1 Drachm opium,
1 Drachm gum arabic,
1 Pint blood warm water.

In severe cases the ammoniacal blister may be applied, as given on the next page, if there is paralysis of the parts, with or without

fomentations. The acute symptoms having subsided, give small doses of copaiva, one to two drachms, or buchu, two to three drachms, as may seem to be needed. Give soft or sloppy diet, with linseed tea, slippery elm, gum arabic, or other mucilaginous drinks.

XI. Foul Sheath.

A horse with a foul sheath is unfortunate in his master, unless the difficulty occurred before purchase.

What to do.—Clean the sheath of all foul matter with warm soap suds, removing all lumps. To wash the sheath, take hold of the yard when protruded, and without undue violence hold it with gentle pulling until there be no resistance when it may be pulled out its entire length. When washed, oil thoroughly with lard and salt, three parts of lard to one of salt. Every other day or every three days wash again and oil until a cure is effected.

XII. Rupture of the Bladder.

This difficulty occurs only in the female, the result of difficult parturition. The animal strains violently, and on examination a red, tumid, rounded mass is shown between the lips of the vulva.

What to do.—Wash the parts carefully with tepid water, in which an ounce of laudanum has been mixed with each quart. Then return carefully, by pressing the center of the mass inwards to correct the eversion. The difficulty will be in returning it through the neck of the bladder. There will be more or less inflammation and softening, therefore care, judgment and time must be used, not to tear the tissues. If there is renewed straining, place a truss or compress over the vagina.

XIII. Stricture of the Urethra.

Stricture of the urethra is the result of local irritation, the results of gravel, or of strong astringent injections. The symptoms are difficult urination, with great pain and frequent erections. The cure must be effected by the use of catheters, gradually increasing them in size until the normal condition is regained.

XIV. Inflammation of the Organs of Generation.

a.—In stallions, there is occasionally inflammation of the testicles, caused by external injury and other causes. It may be known by the

swelling of the parts, a straddling gait, with drawing up and again letting down of the testicles.

What to do.—Give a purgative, 4 drachms aloes in 1 1-2 pints water. Foment the parts twice a day with warm water. Then dry and apply extract of belladonna or laudanum. If pus (matter) should form, known by fluctuation of the parts, open at the soft part. If the gland is involved, and there is threatened destruction of the part, castration had better be performed.

b.—Inflammation of the Womb.

Causes.—Bruises or other injuries at the time of giving birth, or in getting rid of the afterbirth; retained afterbirth, or exposure to wet or cold after parturition.

How to know it.—Two, three or four days after parturition, there will be an attack of shivering: pains, with looking at the flanks, similar to those in colic; shifting of the hind feet; the loins and abdomen tender, with aching of the loins; the vulva red and swollen; there is frequent straining with fetid discharge. The oiled hand being introduced into the womb, the neck and body will be found filled with fluid; the belly will be tense and swollen; the respiration and pulse will be increased, and the temperature of the body hot. There will be grinding of the teeth, great thirst and loss of power in the limbs.

What to do.—After having drawn out the contents of the womb with a catheter, fill it again with tepid water, introduced through the tube, and wash out thoroughly. Then inject one drachm permanganate of potassa in a pint of lukewarm water, adding four ounces of glycerine and half an ounce of laudanum. Give a purgative dose to move the bowels freely, 4 drachms Barbadoes aloes for a mare; (for a cow, 1 pound of glauber salts). Follow this with 20 drops tincture of aconite four times a day for the mare; (for a cow, 30 drops). Give also once a day 5 drachms nitrate of potassa, and also once a day 1 to 2 drachms chlorate of potassa. Apply a blister of mustard to the right flank of the mare, or for a cow, mustard and oil of turpentine. If there is a weak pulse, prostration and stupor, use stimulants; quinine in 15 to 20 grain doses, camphor and whisky; also antiseptics, chlorate of potassa, 1-drachm doses, or carbolic acid 1-2 drachm doses in a pint of water.

c.—Leucorrhœa, Catarrh of the Womb or Vagina.

The same general treatment is to be observed as in the foregoing. It may be known by a whitish discharge from the vulva if caused by retained afterbirth. Repeat the injection recommended for inflammation of the womb, daily, and keep up the system with tonics and good food.

The following will form a good tonic, appropriate in any enfeebled condition of the mare, but especially so in the forms of disease just treated.

No. 134

2 Drachms sulphate of iron,
1 Drachm black pepper,
½ Ounce ginger,
½ Ounce gentian.
Divide into three doses for each day.

CHAPTER VIII.

DISEASES OF THE TEETH AND MOUTH.

I. TEETHING, OR DENTITION. —— II. SHEDDING TEETH. —— III. BLIND TEETH. —— IV. DECAY OF THE TEETH. —— V. SCURVY. —— VI. STUMP SUCKING, OR CRIB BITING. —— VII. LAMPAS. —— VIII. INFLAMMATION IN AND AROUND THE MOUTH. —— IX. SLAVERING. —— X. INFLAMMATION OF THE TONGUE. —— XI. SHARP AND PROJECTING TEETH. —— XII. SCALD MOUTH. —— XIII. APTHA. —— XIV. INFLAMMATION OF THE PAROTID GLAND. —— XV. FISTULA OF THE PAROTID DUCT.

I. Teething, or Dentition.

Dentition in the horse has already been written of and illustrated in the map given in this work. In teething, all animals suffer more or less from irritation and fever of the parts, probably as much so as the human family. In puppies and in kittens it often causes convulsions between the third and sixth month. Cattle are principally troubled between the second and third year, and horses from the third to the fourth year, since in the third year they cut four front teeth and eight back ones, and in the fourth year four front back teeth, eight back teeth and the four tushes. Hence the reason why it is advised that at this period of their lives they be not hard worked.

In both cattle and horses the rising teeth are sometimes entangled with the teeth that are being shed. There will be redness, swelling, tenderness of the gums, and the inflammation sometimes extends to the throat, causing coughing and general fever.

What to do.—If there is slavering; if the animal seems to chew hard food with pain, or bolts soft food with haste, examine the mouth. Extract the loose teeth; lance the gums to allow easy dentition; wash the gums with tincture of myrrh: relieve the bowels if necessary with gentle

laxatives, and give as much rest and soft food as possible. Swine from the sixth to the twelfth month usually cut thirty-six teeth, and sometimes require attention.

II. Shedding Teeth.

In the shedding of the teeth the mouth should be examined frequently for loosened teeth, to find if the new teeth are growing properly. If they are likely to become crowded, causing twisting, they should be straightened, and if necessary one of them extracted to allow them to grow properly. Sometimes there will be disease of the membranes surrounding the roots of the teeth, causing loosening, deviation from the proper course, suppuration, and even shedding of the teeth with much pain, even to inflammation and other diseases of the gum. Relief is to be given by careful examination, keeping the bowels open with soft food, such manipulation as may be necessary, sponging the gums with tincture of myrrh, lancing the gums, and extraction of the loose teeth when necessary.

III. Blind Teeth.

Supernumerary teeth may occur among the nippers and grinders. When so they should be extracted. Blind, or wolf teeth, are not supernumerary, but natural as they are insignificant, and would not be necessary to notice here were it not from the fact that ignorant pretenders have given the impression that they are the cause of blindness, big head, and even apoplexy or staggers. These teeth are certainly useless, and occur in horses (not in mares) immediately in front of the grinders and may be extracted without difficulty or injury, care being taken that they be not broken and thus irritate the gums.

IV. Decay of the Teeth.

The teeth of horses under an artificial system of management, are quite subject to decay. Usually this is found in the grinders, although it sometimes, but rarely, occurs in the nippers.

Causes.—Anything that will destroy the enamel or corrode the teeth, strong mineral medicines, fermentation in the stomach, breaking of the teeth by biting hard substances, or natural causes from increasing age.

How to know it.—The horse will suddenly drop the food from the mouth; slavering and exhibition of pain. This means toothache in its acute form. The general symptoms are imperfect chewing of the food,

and consequent finding of whole grain in the dung; indigestion, unthrifty state of the hair and skin, irritability, loss of condition, generally with swelling of the legs; swelling of the jaw-bone about the carious tooth, quidding of the partially chewed hay, accumulation of food around the tooth, and between it and the cheek.

A HORSE WITH TOOTHACHE.

What to do.— Put a balling iron in the horse's mouth, and examine the jaws for broken or decayed teeth. If suspected, tap it gently. If there is inflammation, lance the affected parts, and sponge with tincture of myrrh. If the tooth is ulcerated, it is better to extract it at once; if not, it may be cleaned and the cavity filled with gutta-percha. If tender from exposure of the nerve, it must be relieved or deadened with crystalized carbolic acid and powdered opium, before filling. As a rule, in extensive caries, the tooth may be extracted. If so, the opposing tooth must be occasionally rasped down. The extracting of teeth, however, should only be undertaken by a veterinary surgeon, except in the case of loose teeth, which may be extracted with a large pair of forceps.

V. Scurvy of the Teeth.

Old horses are subject to deposit of calcareous matter, by which the teeth become ridged with a white scurf, extending down upon the gums, inflaming them and keeping them sore. This is generally confined to the front teeth. Young horses also sometimes suffer from this disability.

Causes.—Imperfect digestion and sour stomach, evolving gases, or any cause injuring the enamel of the teeth.

What to do.—First, find if his system is in good condition, or put it so. Put a twitch on the animal's nose and with proper instruments remove the incrustations. Files, scrapers and fine emery paper are the means to be used, the teeth afterwards to be oiled. In ordinary cases, a stiff brush and a mixture of tartaric acid and salt will do it; rubbing afterwards with clean, hard wood ashes. Keep hard wood ashes and salt where the horse may take it at will.

VI. Stump Sucking, or Crib Biting.

Stump sucking is when a horse rests its teeth against any projection, arches its neck with spasmodic action of the throat, chest and flanks. Crib-biting is when the horse seizes the crib or other hard substance be-

tween the teeth and pulls, with or without spasmodic action. Wind sucking is when the horse suddenly seizes any hard, firm substance with its teeth, pulls back, sucking in the air, sometimes with so loud a spasmodic action, noise and groans that it may be heard for a long distance, with swallowing and eructation.

What to do.—It is probably more generally connected with disease of the teeth than is generally suspected, and these should be immediately examined for cause. At length it becomes a confirmed vice. Relieve any disabilities from the teeth. The remedy is to allow no surface uncovered with sheet-iron where the horse may reach it. Smearing the front of the manger with aloes has been recommended. A muzzle with two iron bars projecting from the lower jaw over the mouth and extending over and between the nostrils, will prevent the vice. If the disease be pure wind-sucking, a strap fastened tightly about the upper part of the neck will prevent the effort, but there is danger of the horse becoming a roarer.

VII. Lampas.

Lampas is congestion of the palate; a redness and swollen condition of the bars of the mouth behind the upper front teeth, caused by dentition in young animals, and in old ones from indigestion, causing pain in chewing from the protrusion of the tender parts.

What to do.—If in young horses, the means advised in dentition, with slight cutting (scarifying) of the roof of the mouth, with a sharp knife or lancet will suffice. In old horses, scarification, with a general attention to the health of the animal will be indicated. In scarifying, cut only about an inch back of the teeth, and never deep. Just behind the third bar an artery lies near the surface, difficult to manage if cut through. Hence the care required in bleeding in the roof of the mouth. Should, by accident the artery be severed, put a strong cord around the upper front teeth close to the gums, and strain it as tightly as possible. This will generally close the orifice and stop the bleeding. As a wash for the gums, the following will be good:

BURNING FOR LAMPAS.

No. 135. 1 Oz. chlorate of potash,
2 Ozs. soft water.

Never burn the bars of the mouth for lampas. It is as senseless as it

is brutal and cruel. Never use *caustics*. The bars of the mouth are useful to the horse, as the palate is to man, and may not be tampered with with impunity.

VIII. Inflammation in and Around the Mouth.

Causes.—Irritation from wounds, bruises, acrid or poisonous plants, savage bits, injuries from the bit, twitch or rope around the under jaw and tongue, medical irritants, bites or stings of reptiles or insects, the use of calomel and other salivating drugs, fungus growths, specific fevers, etc.

How to know it.—There will be difficulty in feeding and drinking, slavering with or without fetid saliva, swelling and rigidity of the lips, cheeks or between the bones of the lower jaw, blisters or sores within the mouth, swelling of the glands, etc.

What to do.—Find the cause, whether from mechanical injury, irritating food or irritant drugs. If injured by alkalies wash with vinegar and water, equal parts; if by acids use lime water or a weak solution of bicarbonate of soda; if caused by caustic salts use mucilage of slippery elm, or white of egg; if from venomous bites apply ammonia and give one-half ounce of liquid ammonia internally to the horse, and one-half to one ounce to the ox. For bite of venomous snakes, tarantula, etc., cauterize the wound in addition and give whisky in full doses. If there is simple inflammation, open the bowels with a gentle laxative, two ounce doses of magnesia, and wash with vinegar and honey. Give plenty of cool water and soft food. If there are ulcers, touch them with a feather dipped in

No. 136. 10 Grains lunar caustic,
1 Ounce rain water.

If there is much swelling keep the head tied up. If tumors resolving into matter (pus) appear, open with a lancet or knife. If there is sloughing of the parts (separation of dead flesh) wash with the following:

No. 137. 1 Drachm permanganate of potassa,
1 Pint of water.

IX. Slavering.

Causes.—The result of mercurial salivation, symptoms of various affections, as apthous fevers, epilepsy, cutting teeth, ulcers of the mouth, irritating food, alkalies, acids, bad fodder, etc. White clover will often cause undue secretion of saliva by the glands.

It may be known by the free discharge of saliva, great thirst and often indigestion.

What to do.—Find the cause and remove it. Give cold water to drink, and sound grain, grass and hay. Use as washes for the mouth, vinegar and water or vinegar and honey. If the saliva is offensive, use water slightly tinctured with carbolic acid as a wash, and attend to the general health of the animal.

EFFECT OF CRUEL USE OF THE BIT.

X. Inflammation of the Tongue.

How to know it.—There will be difficulty in eating and drinking. The tongue will be swollen and inflamed, sometimes hanging from the mouth.

What to do.—Use the same means recommended for inflammation of the mouth, first having thoroughly searched for wounds from any sharp substance having punctured and remained in the tongue. If the tongue hangs from the mouth put the end in a bag, and support it with tapes extending from the corners of the mouth and tied behind the ears. Great relief may be afforded the suffering animal by this means.

XI. Sharp and Projecting Teeth.

The remedy for this disability will be obvious. Secure the animal, put a twitch on its nose, if a horse, and a balling iron in the mouth and file the teeth until smooth and even, using a rasp made for this purpose, flat and with a slightly crooked handle.

XII. Scald Mouth.

Causes.—The ignorant use of acid drenches or corrosive drugs by careless or ignorant stable men. Medicines of unusual strength are sometimes sent with directions for diluting. If labels were carefully read, and directions implicitly followed, there would be less of this distressing malady, often ending in chronic disease of the stomach.

How to know it.—The mouth is red, often raw; the lips are in constant motion, moving up and down; the saliva flows continually, showing the pain the animal endures.

What to do.—Give well-made cold gruel, either of corn or oatmeal, and soft food if the horse can take it. Boiled carrots are excellent if the animal will eat them. Prepare the following lotion:

No. 138. 5 Ounces of powdered borax,
2 Pounds of honey,
1 Gallon of boiling water.

Mix, let it become quite cold; hold up the horse's head moderately and pour half a pint into the mouth. At the expiration of half a minute allow the head to gradually drop so the fluid may flow over the inflamed surfaces. This should be repeated several times a day. Beyond this nothing can be done except to attend to the general health of the animal, which should do no work until entirely recovered.

XIII. Aptha, or Thrush.

A disease incident to sucking animals and young horses, generally occurring in the Spring and Fall.

How to know it.—Red patches will appear on tongue, cheeks and lips, which assume a whitish color, caused by a fungus growth (*œdium albicans*). The lips swell; the tongue hangs out of the mouth; vesicles form containing a clear, gelatinous fluid. At length these burst; crusts form and recovery ensues.

APTHA.

What to do.—Give the animal soft food as recommended for other mouth diseases. Wash the mouth with the lotion prescribed for scald mouth, or prepare equal parts of honey and powdered bayberry bark into a paste, with which anoint the affected parts every night. To purify the blood and promote the general health give the following:

No. 139. 1 Ounce flowers of sulphur,
1 Ounce powdered sassafras bark,
2 Ounces powdered golden seal.

Mix, divide into four portions and give one every night in scalded shorts allowing it to get cold. Or give it in cold gruel as a drink. This prescription will be found valuable in any case and for all farm stock when the blood is thick and inclined to humors. Give fully grown swine half the dose prescribed, and full grown sheep one-third the dose; that is, divide into eight doses for swine and twelve for sheep.

XIV. Inflammation of the Parotid Gland.

Causes.—This gland, which lies in the hollow that extends from the root of the ear to the angle of the lower jaw, sympathizes with inflammation of the upper part of the throat, and becomes hot, tender and swollen in almost ever case of cold. It is liable to inflammation also

from mechanical injury, and from obstruction of its duct. In bad cases of strangles or distemper, it will sometimes swell to great size and will break, a fistulous sore being the termination.

How to know it. — When the gland has become swollen, it is easily discernible by sight or feeling. There is a hard and painful lump beneath the ear, with a softer feeling about its edges. The horse carries his head stiffly, chews slowly and with difficulty, and has some general fever.

What to do.—As this state of the gland is almost always preceded by cold, and is accompanied by it, the treatment must be first directed to the removal of the exciting cause. Place the animal in comfortable surroundings, attend to the state of his bowels, giving 3 ounces glaubers or epsom salts, in case of constipation, and a few warm mashes. Meanwhile, cover the affected gland with a good poultice until the inflammation is subdued.

If inflammation results from mechanical obstruction, that obstruction must of course be removed before any permanent relief can be obtained; and this may require the removal of a calculus or stone from the parotid duct, which can be safely done only by an experienced surgeon.

If attention is not directed to the swelling until matter is forming, allow it to approach the surface and come to a head before attempting to open, to avoid cutting any of the ducts, which might result in a fistula. If the tumor becomes hard, use iodine, almost to the extent of blistering.

Any wound inflicted mechanically, as a cut into the gland, or a prick with a stable-fork, must be treated externally according to its nature—the main point being to close it so effectually that the salivary fluid which it is the office of this gland to secrete cannot escape through the wound.

XV. Fistula of the Parotid Duct.

Causes.—The parotid duct, which is formed by a union of the smaller ducts of the parotid gland, enters the mouth after it leaves the gland, in front of the large masseter muscle of the cheeks—having passed for some distance upon the inner side of the jaw, and then turned under the lower border of the bone. The saliva secreted by the parotid gland, which lies at the spot where the neck joins the jaw, is poured into the mouth by this parotid duct, to be mingled with the food during the process of mastication. If the mouth of this little tube is closed in any way, so as to prevent the free egress of the saliva, distension of the duct takes place, and the confined secretion causes suffering, inflammation, and finally rupture. This stoppage is sometimes caused by hayseeds or other particles of food that enter the mouth of the channel while the

animal is feeding. The presence of food in the mouth and the motion of the jaw stimulate the action of the gland, and since the saliva thus secreted cannot escape by its natural opening, there is constantly more and more pressure until some outlet is found. This, as we have said, may be by bursting, or it may be by external accident. A wound inflicted on the jaw with any pointed instrument, as a hay-fork, has been known to penetrate this channel. The saliva thereupon pours through the opening, and by its constant flow it prevents the healing of the wound, so that its edges speedily become hard and without that liveliness essential to the closing of punctured or gashed flesh.

The stopping of this passage into the mouth is said to have been sometimes caused by calculus or stone in the cheeks of the animal. These, of a size exceedingly large in proportion to the size of the duct in which they lodge, have been taken from the jaw.

Every wound which penetrates this or any other duct of the salivary glands soon becomes a fistulous and offensive sore; the fluid secreted by the gland finds its way out through the false opening, while none of it enters the mouth to perform its natural function in preparing the food for the stomach, so that the horse soon begins to lose flesh, and finally assumes a wretched and loathsome appearance.

The opening of the parotid duct occasionally occurs, perhaps, from the opening of abscesses attending strangles or distemper.

How to know it.—The digestion necessarily becomes deranged when the process of mastication is carried on for any considerable length of time without the foods being moistened by that secretion which the parotid duct in a healthy condition furnishes; but the orifice in the skin under the jaw or on the cheek at the large muscle, discharging a liquid somewhat resembling the white of an egg, is the unmistakable indication of the disorder under consideration. During the act of feeding this fluid is freely discharged, even sometimes squirting from the wound, and especially so if the food is dry and hard to chew. It will be noticed that in chewing the horse uses the opposite side of the mouth from that on which the opening occurs, and that the process is slow and difficult. The edges of the wound soon become callous, the running of the stream down the cheek destroys the hair, and the whole part has a fistulous and filthy appearance.

What to do.—In the first place, especial care must be taken to keep the animal, during the period required for effecting a cure, upon food that requires no chewing. It should be sufficiently plentiful and nutritious to prevent the uneasiness of hunger. Soft mashes and gruels alone should constitute the diet. Another precaution is necessary when he is

left to himself—that is, to tie him up in such a way as to prevent him from rubbing the wound. This can be done by having a rein at each side of the halter, and tying it up, one to each side of the stall, and sufficiently back and high up to keep him from putting his jaw against either the trough or the wall against which it stands.

If the wound has recently broken, shave the edges so as to remove all roughness and bring them closely and evenly together. Then cover with collodion, putting on coat after coat until it is strong enough to keep the wound from bursting.

If the sore is of long standing, and the case evidently obstinate, the first care must be to determine whether the channel has become closed between the wound and the mouth, as sometimes happens. If so, make a new one and keep it open by passing a thread through it. This thread must have a flat button affixed to each end, one inside the mouth the other outside the wound, to retain it in place. It should not be so closely shortened by the buttons as to prevent its being slipped a little, first one way then the other, until the walls of its passage have become callous or firm, and not likely to adhere. It must then be withdrawn, and the way being open for the secretion to escape into the mouth the outside wound must be closed. To do this, make an adhesive fluid by saturating gum mastic with the strongest spirit of wine, or by dissolving India rubber in sulphuric ether. Pare off the edges of the wound till the healthy skin and flesh are laid bare, which may be known by bleeding. Now wash the surrounding parts thoroughly with warm soap suds, so as to remove the oily secretion from the skin and hair, and render the latter dry, so that an adhesive preparation may the more readily stick. When the bleeding has stopped and the hair is dry, lay over the orifice a piece of India rubber, and over that a cotton cloth. Fix the cotton firmly by means of the adhesive fluid above mentioned, first attaching one side, then, when that is dry and firmly fixed, stretching and fastening down the other edge. Continue to fasten on these strips one after another in this way—some of them cross-ways—until there is a good body of them; then thoroughly saturate the whole with the adhesive fluid and tie up the animal as already directed. When his reins are loosened in order that he may eat, he must be watched to see that he does not rub and re-open the wound.

This one covering, as described, is generally sufficient to effect a cure, but if it falls off before the orifice is entirely closed, wait a day or two, still feeding on soft food, and then put on another coat of the India rubber, cotton, and mastic solution; and so continue until a cure is effected.

CHAPTER IX.

DISEASES OF THE HEART, BLOOD, ETC.

I. THUMPS.——II. SCROFULA.—— III. FEVER, OR GENERAL INFLAMMATION.——IV. ENLARGEMENT OF THE HEART.——V. FATTY DEGENERATION OF THE HEART.——VI. ENLARGEMENT OF THE ARTERIES.——VII. INFLAMMATION OF THE JUGULAR VEIN.——VIII. INFLAMMATION OF THE ABSORBENTS.——IX. SCARLATINA.

I. Thumps.

Palpitation of the heart, or thumps, as it is usually called, may occur from fright, in highly fed, irregularly worked animals, but is not as a rule connected with structural disease of the heart.

Causes.—Indigestion, some blood diseases, sudden excitement or fright in animals predisposed to nervousness.

How to know it.—The action of the heart will be violent and convulsive; the beatings can be seen, felt and heard. The disorder comes on abruptly, generally from excitement, has perfect intermissions with abrupt jarring thumps, and a jerking motion of the abdomen, and unaccompanied by redness of the mucus membranes; excited eyes, rapid breathing and a more or less sudden diminution of the palpitation. If signs of temporary excitement are not present; if the attack comes on slowly, is constant with aggravated intervals; if there is a heavy, prolonged, unequal beating, with red mucus membranes and swelling of the limbs, it may be inferred that the difficulty is connected with structural heart disease.

What to do.—Avoid sudden excitement and over-exertion, but give regular but gentle exercise, stimulants and tonics. The following would be indicated as a stimulant, either whisky, or 1-2 ounce liquid ammonia. Give 15 to 20 grains digitalis twice a day in the feed, for some weeks.

If there is a full, strong pulse, and increased size of the heart, add to the digitalis 20 drops tincture of aconite, twice a day, or drop it into the water given twice a day. If there is general debility, the following will be indicated, to be given twice a day for several weeks:

No. 140 ½ Drachm powdered nux vomica,
1 Drachm extract of belladonna.

Form into a ball with liquorice powder and molasses, and give.

II. Scrofula.

The horse is not subject to scrofula, as is man, and the lower farm animals. Swine are essentially scrofulous; sheep are often so; cattle more rarely, and horses least of all. Yet that this noble animal has the germs of this dread disease in his system, would seem to be indicated by ulcers on the liver, tumors in the glands, and tubercles of the lungs. Thus it may be found in connection with other diseases, or show itself in eruptive skin, or of the organs.

What to do.—Stramonium, known to farmers as Jamestown or Jimson weed, is a specific. Give every other day half an ounce of the dried seed, bruised, or 20 to 30 grains of the stramonium of the druggists, daily. The ox may have from 1-2 to 1 drachm; sheep 5 to 10 grains, and swine 4 to 6 grains daily, the state of the bowels being carefully attended to by giving laxative food if costive, or if necessity occur, medicine, Glauber salts in light doses.

III. Fever, or General Inflammation.

When from any cause injury is done to any part of the frame, or inflammatory action is set up either in the tissues, membranes, or any of the organs of the body, heat is produced, and this is fever. This often becomes general from sympathy, thus in a measure relieving the pressure on the more closely affected parts. Fever is not the disease itself, but the result of disorganization, a symptom of disease, or internal disorder. In fact, a symptom of disease arising from sympathy of the system with disease of the animal economy. Remove the cause and the fever will cease. We may do something to alleviate it in connection with the treatment of the disease itself, but we must not lose sight of the latter.

In intermittent fevers there is a cold stage, a hot stage and a sweating stage. These may vary in succession and degree, but the real difficulty is in a morbid state of the viscera, but particularly of the liver and organs employed in the formation of bile, and of the mesentery. In fevers the tongue is coated. Yet no quack is so ignorant as to suppose

the fever can be cured by scraping the tongue, and yet this is fully as sensible as to suppose fever to be the disease itself when it is an effect of disease.

In the horse fevers often manifest themselves through inflammation of the mucous or serous membranes, producing catarrh or influenza. When it affects the mucous surface of the stomach and bowels it produces extreme languor and debility. In pleurisy there is inflammation of the serous membranes within the thorax. The fever is the manifestation of the disease. In typhoid fever there is inflammation of the brain and viscera and especially of the stomach, intestines and peyers gland. The fever is the attendant simply upon the cause of the inflammation.

Fever in horses has been described by the author of Hippopathology to be 1st. Common fever—a general diffuse inflammation. 2d. Idiopathic—arising without any apparent local injury. 3d. Symptomatic—arising from some local cause or irritation. The late Dr. Dadd, V.S., very truly says:

"A rational system of veterinary medicine contemplates, in the treatment of febrile symptoms, nothing more than a kind of expectancy. If the patient be in the cold stage, administer warm diffusible stimulants and diaphoretics, aided by warmth and moisture externally; friction on the extremities, and, if necessary, stimulating applications to the chest and the extremities. In the hot stage, and when the superficial heat of the body is great, cooling drinks are indicated: water acidulated with cream of tartar, makes a good febrifuge. The patient may be occasionally sponged with weak saleratus water. The alkali has a beneficial effect on the cutaneous vessels, while the water lessens the temperature of the body. No treatment, however, can be of any rational use, unless it contemplates a restoration of the healthy equilibrium of the whole system. Let the doctor treat the disease, and a good, attentive groom can manage the fever."

In treating general fever or inflammation, therefore, we must first find the cause, and treat, giving such agents as have been indicated throughout this work, for the febrile symptoms as they occur. As a rule we do not advocate bleeding, but in the horse in the early stages of acute inflammation, especially of the brain, and all that class of diseases which involve the general system, and when the blood is thick and dark, sometimes almost brown, bleeding may be practiced with success. It is never well however to bleed blindly. In apoplexy and that class of diseases, bleed. It is a case of life or death. For fevers in general there can be no specific. In diseases of the blood, accompanied by fever, alteratives will be indicated both as a preventive and corrective of the diseased functions. Sometimes the condition of the absorbents are so inactive that alteratives

cannot act. Here bleeding would seem to be indicated. Yet it is better unless in the case of life or death, that it be not resorted to, except under the advice of a competent veterinarian or physician.

IV. Enlargement of the Heart.

Hypertrophy or enlargement of the heart is an increase of its muscular substance and may be confined to one side or one ventricle. Sometimes disease of the valves leads to enlargement much beyond its usual size. Enlargement of the heart also accompanies broken wind and other impediments to the free action of the lungs and breathing tubes.

Causes.—Long continued hard work; chronic indigestion, or some obstruction to the circulation.

How to know it.—There is palpitation, the beats forcible and prolonged, the intervals of silence shortened. The first sound is low, muffled and prolonged, the second loud, and if only one ventricle is affected sometimes repeated. The pulse is as a rule regular, except under excitement of the animal, and, the excitement removed, soon returns to its usual state. The breathing is often hurried, and exertion increases the general symptoms in a marked manner.

What to do.—Simple hypertrophy is seldom the cause of imminent danger. It is not unusual for horses with an enlargement of the heart to do steady, slow, moderate work, and live to be old. If there is dilatation, weakness, blowing murmurs with the first heart sound, spells of oppressed and difficult breathing, if the nasal and other visible mucous membranes are livid, there is danger of sudden death at any time.

Keep the animal quiet, and at only slow, moderate labor; never overload or put him to speed. Let the diet be of good, easily digested food; never allow the stomach to become overloaded. Give twice a day from 20 to 30 drops tincture of aconite root as the case may need. If there is broken wind or other serious impediment to breathing, 3 to 4 grains of arsenic in the food has been found useful. If the case, however, be of long standing, or due to permanent obstruction, treatment must be simply alleviation. The case will eventually end in death.

V. Fatty Degeneration of the Heart.

This disease is occasioned by a change of the muscular substance of the heart to a fatty state, by which the organ is weakened, at length leading to rupture of its tissues. It is not uncommon in high-bred stock, including cattle and swine.

Causes.—High feeding, inactivity, want of exercise, and the result of such diseases as purpura scarlet fever, and diseases the result of profound alteration of the blood.

How to know it.—Debility in the circulation, irregularity and weakness in the pulse, lessening of the heart sounds, swelling of the legs and sometimes a general dropsical condition, dilatation, a want of correspondence between the heart beats and the stroke of the pulse, appetite irregular and capricious, and the membranes of the mouth and nose a rusty red color.

What to do.—Humor the appetite with sound, easily digestible food. There is no remedy. Attention to the general health, and an ounce of chlorate of potash twice a day in the food may mitigate symptoms when more violent than usual. In all heart or arterial diseases give rest, and in fattening stock, do so as quickly as possible.

VI. Enlargement of the Arteries.

Dilatation of the arteries (Aneurism), is rarely found. It is a thinning and weakening of the coats of the vessels, sometimes to bursting, causing a pulsating tumor containing blood.

Causes.—Severe strains in the vicinity of an artery, blows, kicks, stabs, or weakening from overstretching, as in fatty degeneration. In the mesenteric arteries of horses, they are common from immature worms (*Sclerostomum equinum*) in the circulation.

How to know it.—There is a soft, fluctuating, visible tumor if near the surface, which may be reduced by pressure, but which instantly reappears.

What to do.—Treatment is not successful except when near the surface. Then steady pressure by a pad if taken early will sometimes cause its disappearance. An animal with enlargement of the arteries is unsound and should never be bought. The same rule applies to all diseases of the heart.

VII. Inflamed Jugular Vein.

Causes.—This is due, for the most part, to bleeding, and the treatment to which the horse is subjected, or rather lack of treatment immediately after blood-letting. It is not to be attributed to any particular manner of bleeding, or to any awkwardness in its execution and in the closing of the wound. Some horses have a constitutional predisposition to inflammation upon any occasion of punctured veins, and the most skillful phlebotomist cannot avoid throwing them into this state unless care is taken

after the operation to see that there is as little exciting cause as possible. Inflammation may, indeed, result from bruising the vein in the act of bleeding, but this must be of so rare occurrence as to be scarcely worthy of notice. The same may be said of a large and ragged wound made by a bungling operator.

The motion of the animal after bleeding, and rubbing so as to displace the pin and tow by which the wound is usually closed, may be set down as the great sources of danger. If the horse is turned loose and allowed to graze about, hanging down his head and keeping it down at will, with his jaws in almost constant motion, inflammation of the vein is apt to result. So, if he is allowed access to food in a trough or stable. When allowed his freedom he is apt to rub the wound whenever itching sensations supervene, as they are apt to, and the trouble is thus easily induced. If put to the saddle immediately after blood-letting from the neck, the bridle reins may rub the wound, and especially irritate it by disturbing its fastenings; and if put to harness the collar may press the blood too violently and constantly against the orifice, and so bring on inflammation.

How to know it.—The earliest indication is a slight opening of the lips of the wound, whence exudes in small quantity a thin, watery discharge. A slight swelling appears; this is followed by a hard, cord-like enlargement of the vein, which feels hot; and there is some visible swelling at the angle of the jaw. The swelling takes place above the orifice, and the inflammation tends almost wholly in that direction.

If neglected, the second stage of the disorder soon sets in. Abscesses form along the vein, and these finally burst and discharge a thin but filthy pus. These tumors are united at their bases by sinuses in the interior of the vessel.

It may be reckoned as a third stage of the disease when the vein feels hard under the skin, and the abscesses discharge a dark, impure and stinking pus, resembling rotten blood. At this stage the horse grows dull and stupid; then at last the inflammation extends to the brain, and a madness similar in violence and fatal effects to the rabies may supervene.

What to do.—In the first place, "an ounce of prevention is worth a pound of cure," and whenever it is necessary to bleed an animal, let it be done in as neat, skillful and expeditious manner as possible; then close the wound with care, leaving no part of the fastening pin to project over the suture or winding of tow or cord by which the lips are drawn close; and at once tie up the horse in a stall. If the stall is contracted in width, it is all the better, as he will be less likely to stir unnecessarily.

Tie the halter above and something back from the manger, so that he cannot rub his neck against the trough nor anything pertaining to that part of his stall. Give him no food that will necessitate chewing—

nothing but a sufficiency of thin, cool gruel, having in it no inflammatory ingredients, to prevent the absolute gnawings of hunger. Water may be given in as great quantities as he will take.

Allow him to remain in this position twenty-four hours. Even then, do not turn him into a field, as the traveling to and fro, with the head often pendent and the jaws in motion as he grazes may yet cause inflammation. He may now, however, be allowed a more roomy stable; but the food should be for another day only such as will necessitate no considerable chewing. This precaution will in all probability wholly prevent inflammation, even in those cases where the animal has a strong constitutional tendency to it.

These directions, however, are not to be understood as applicable to every case. When a horse is bled to relieve some sudden or acute local trouble, there is really but little danger of inflammation of the jugular, especially if the acute trouble is attended with marked local fever.

When inflammation has actually set in, from whatever cause, the cure is easy and speedy, if steps be promptly taken to this end. If begun while in its simplest stage, place the horse at once in a stall, as previously indicated, and tie his head up during the day—giving him food and drink by raising a bucket within easy reach for the time. Then sponge the inflamed part very frequently with the following lotion, as cool as it can easily be made:

No. 141.
3 Ounces tincture of arnica,
2 Ounces muriate of ammonia,
4 Ounces methylated spirits of wine,
3 Pints water.

It will be more effectual if some soft padding is confined along the whole extent of the inflammation, and this kept constantly saturated with the cold lotion.

After the inflammation has subsided, mix biniodide of mercury and lard in the proportion of 4 drachms biniodide to 4 ounces lard, and rub the vein well with this, if it remains enlarged, every night until the new deposit has been absorbed, which will be known by its having produced a free watery discharge.

The treatment thus laid down is intended to apply strictly to the first stage of the disease. When the second stage has set in before treatment is begun—that is, discharging abscesses along the vein—begin by removing the pin and suture, if not already done, and then blister along the whole extent of the inflamed and tumorous surface by rubbing in effectually the oil of cantharides, or liquid blister. One blister must succeed another till every sign of the disorder has disappeared. If the case seems to be violent and to yield slowly, one blister must not wholly cease to

act until another coating of the oil has been applied—though this is not necessary except in very obstinate cases. If the liquid is to be applied over an old one, still raw, use a fine brush with which to lay it on, and then cover over with an application of some unctuous oil to soothe the severe smart that presently sets in. Be careful always to have the blister cover every spot where there is indication of inflammation.

If the disease has progressed to that stage in which there is a foul and black discharge, the abscesses must all be joined by slitting up the intervening sinuses. Cut the whole extent of the hardened vessel except a little at each end, which must be left to prevent copious bleeding. Employ a small, suitable probe, carefully and patiently, and cut along the track indicated, from abscess to abscess. Then apply the liquid blister as directed, regardless of sores or cuts, and continue to do so until the part is but one blister sore and not a lot of discharging tumors.

The vein will of course be destroyed. Whenever the corded and suppurating state sets in this is inevitable, as no human agency can restore its functions; but this will not seriously interfere with the circulation, since the smaller vessels that ramify every part of the neck (as, indeed, of the whole system) soon accommodate themselves to the new order of things, and the life-current flows regularly on. It requires much time, however, to bring him to that condition in which he will not need more than ordinary attention. Throughout the day his head must be tied up to the rack, while at night he may be loosened so as to permit him to lie down. The floor should be covered with tan, as he would chew straw, and thus render cure more difficult by that motion of the jaws which is to be guarded against. He should be kept this way for from four to seven weeks, according to progress of recovery. Meanwhile his food should be hay tea, sloppy mashes, and cooling gruel moderately thick. No solid food should be allowed—no corn nor oats. Potatoes, carrots, turnips, boiled, reduced to pulp, moistened and mixed with bran, form the best diet.

At the close of the time designated begin regular daily exercise—very little at first, but gradually increasing it, which may be continued for two or three months, during which time he should not wear a collar, or be in any way subjected to pressure about the neck. After three months he may be restored by degrees to the use of solid food; but much care should be observed during a whole year, after which he may be considered measurably sound.

Inflammation may follow bleeding from leg veins, and those elsewhere, but it is most common in the jugular and most troublesome. The treatment were prescribed is of course applicable in its general principles to other veins.

VIII. Inflammation of the Absorbents.

Inflammation of the absorbents (*Lymphangitis*), has a variety of names, among which are Weed, and Shot of Grease, and may be a constitutional case, or a mere local affection. In its constitutional form, it is found in heavy lymphatic, fleshy-legged horses that, hard worked on heavy feed, are left in the stable for days together.

In its local form it is the result of wounds, bruises, injuries of various kinds, putrefying matter in and around the stable. It may occur from the specific poison of glanders, farcy, etc., and in the constitutional form may go on to abscess, sloughing and unhealthy sores, and death; or the horse may be left with the limb permanently thickened. In the local form there may be abscess, diffuse suppuration, induration of the glands, and even the vessels and surrounding parts.

How to know Constitutional Lymphangitis.—There will be more or less shivering; in bad cases severe, quickened breathing; rapid, hard pulse; a general feverish state, and fever in one or both hind limbs. Enlargements may be detected high up in the groin, by the side of the sheath in the horse or udder in the mare, and great tenderness of the inguinal glands. The shivering fits will be succeeded by fever with burning sweats, swelled limbs, exudation and filling, sometimes to the body.

What to do.—In mild cases, give moderate and daily exercise, pay attention to diet, ventilation, and cleanliness. If the case is more severe, give from 4 to 6 drachms of aloes, apply warm fomentations continually to the limb, with walking exercise. The bowels having been thoroughly moved, give diuretics, an ounce of saltpeter in a gallon of water two or three times daily; or 10 grains of iodine. In very bad cases, when the subject is plethoric, bleed from the jugular vein until the pulse softens, and proceed as before directed. For "thick leg," a chronic thickening of the limb, bandage from the foot up when the animal is in the stable, and apply tincture of iodine for four days, giving daily exercise; or rub the limb with iodine ointment, and give the following once a day:

No. 142.
½ Ounce powdered resin,
½ Ounce niter,
10 Drops oil of juniper.

Mix into a ball with liquorice powder and molasses.

If abscesses form, open them with a sharp knife, and dress with the following:

No. 143.
1 Ounce carbolic acid,
1 Pint distilled water.

In the local form there will be slight swelling of the cords, and redness in white skins. The lymphatic glands will be enlarged along their course, and become nodular or knotty. There will be pasty swellings of the parts, and even erysipelas.

What to do.—Give rest, and a purge of aloes as recommended for the chronic state. Wash the diseased limb with the following:

No. 144. ½ Drachm opium,
1 Drachm acetate of lead,
1 Drachm carbolic acid,
1 Quart rainwater.

In case of excessive inflammation, poultice with flax seed or bread and milk to hasten suppuration. Open the suppurating parts to let out the matter, and dress with the carbolic solution as in the other form of the disease.

IX. Scarlatina.

Causes.—This disease, called also scarlet fever, is not considered contagious in its milder forms, but in a malignant stage it would doubtless be as much so as the same disease in the human family. It is sometimes regarded as but a mild form of acute anasarca, and not entitled to be treated as a distinct affection; but we cannot dwell upon the niceties of classification, and where the necessities of the case (the knowledge requisite for treating certain manifestations of disease successfully) are met, it is not important that we should.

It generally follows influenza and other affections of the respiratory organs; and may be justly said to have its origin in colds, and in some cases, perhaps, in the breathing of vitiated air in close, dark, ill-ventilated stables.

How to know it.—The patient exhibits great thirst, with a failing appetite, and evident weakness. He is more or less unsteady in his gait; his breath is hot and stinking, and all the limbs are swollen. But the most unmistakable signs are elevated blotches on the skin about the neck and fore limbs, and scarlet spots, of variable size, on the membranes within the nostrils.

What to do.—First, remove the animal from its fellows, for fear the disease may develop into that putrid form which is found so contagious among children, and prove infectious. Give an occasional watery bran mash to keep the bowels open and allay fever. If this is not found sufficiently laxative, give a dose of Epsom salts, or linseed oil. Guard against too active and violent purgatives. Mix three ounces liquor acetate

of ammonia with three ounces of cold water, and drench with this once or twice a day, according to the violence of the fever, for three days. Meanwhile, sponge the elevated spots on the skin with a tincture of muriate of iron mixed with warm water; or, if found more convenient, put two ounces of hartshorn (aqua ammonia) into a quart of soft water, and use that.

There is a tendency in this disease to dropsical effusions, and the limbs become very much swollen, even during the treatment prescribed; and by the third or fourth day a whitish mucus will begin to run slightly from both nostrils; the scarlet spots will have spread and become redder. Give now, night and morning, one-half fluid ounce sweet spirits of niter, for four or five days. Discontinue to sponge the elevated spots, but rub the limbs closely and often; and blanket the animal if necessary to keep him comfortable. The niter acts as a diuretic, and the dose and length of time it is given must be regulated by the effect upon the kidneys. If urine is voided too often and too freely, lessen the dose, or discontinue it altogether. Follow this up with a daily dose of twenty grains of sulphate of quinine for from three to six days, and continue to rub the limbs. When there are signs of returning appetite, give him, in addition to the bran mashes, a few oats and a daily small allowance of hay; and place him in a small inclosure, where he may have such moderate exercise as he may be prompted to take. Do not fail to supply him from the first with all the pure water that he will drink.

CHAPTER X.

DISEASES OF THE BRAIN AND NERVOUS SYSTEM.

I. HYDROPHOBIA, OR RABIES. — II. MAD STAGGERS, OR PHRENITIS. — III. BLIND STAGGERS, MEGRIMS, OR VERTIGO. — IV. APOPLEXY, OR SLEEPY STAGGERS. — V. ABCESS WITHIN THE BRAIN.

I. Hydrophobia, or Rabies.

Causes.—This is the name given to a madness which generally arises from the bite of a dog, though wolves, foxes and cats are also subject to it by a spontaneous generation, and this bite is as fatal to another animal and to man as that of the dog. It is believed by some authorities that in rare cases hydrophobia arises spontaneously in the horse; but of this there is no proof; and since it may have been communicated by something of the dog or cat kind, even in those cases where all the outward signs are lacking, it is safe to say that the horse takes it only by inoculation. He need not be absolutely bitten. The licking of bridle-bit sores at the corner of his mouth by a mad dog is sufficient to introduce the poison by absorption; and if the horse by any means chances to take into his mouth and stomach, with his food, the saliva or spittle of a mad animal, he will very probably be attacked, and especially if the animal so dropping the spittle is suffering with the disease in its violent stage. The poison is known to reside in both the spittle and the blood of its victim.

When once the virus has been generated in or communicated to any animal, hot weather, abuse, want of water, want of good food, will produce that feverish state which is so favorable to its development; and the greater or less time in which it manifests itself decidedly in horses after inoculation, is probably due to these conditions or the absence of such. The poison remains in the system, without producing the positive symp-

toms, from three to eight weeks. Some declare that a longer period than even eight weeks sometimes intervenes between inoculation and positive madness; but such cases, if there are such, must be extremely rare. They form the exception, and contradict the great mass of testimony on this subject.

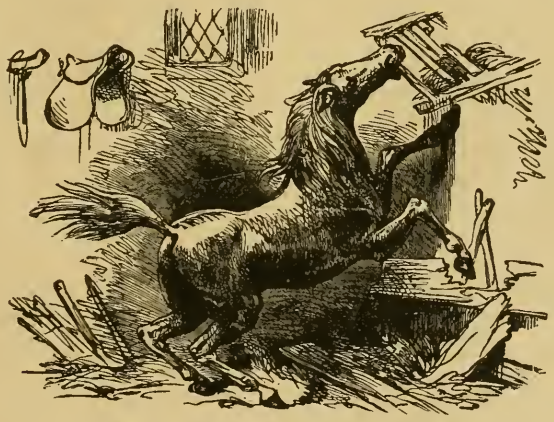
The remote cause—that which produces it in animals of the dog and cat kinds—we need not attempt to discuss, as it can have little if any practical bearing on the subject in hand. It may be well to observe, however, that most of the lower animals contract the disease when bitten by dogs that are violently mad, whereas among men it is widely different. Statistics seem to show that less than fifty per cent. of the latter take the disease. It has been offered in explanation, that the bite is generally through clothing, that serves in many instances to cleanse the teeth of the virus before the skin is reached. In the case of horses, the bite is generally on the lip—a sensitive and vascular part, where the absorbents are readily reached.

COUNTENANCE OF A HORSE WITH RABIES.

How to know it.—Blood on the lips, or elsewhere, with marks of violence, are of course to be regarded as symptoms of dog bite, if any known occasion for such a thing has existed; and for a few days these will be the only indications. If the horse is high fed and full of blood, and the weather is hot, the poison may begin to produce outward effects in from five to ten days by a swelling of the bitten parts, and by a difficulty manifested in swallowing. In from twelve to fifteen days there is perceptibly increased pulsation; inflamed throat, with thickening of the membrane that lines it; from the fifteenth to the twentieth day the stomach inflames, and perhaps rejects food,—but nothing certainly can be stated as to this point, since here the symptoms vary greatly with different animals: in some cases the appetite is voracious, and so morbid that the sufferer will devour his own excrement and urine. Sometimes he will exhibit burning thirst and drink freely, while again water will cause spasmodic movements and be avoided with horror. But in general, the appetite is destroyed, and that dread of water which characterizes the disease in man is present in the horse.

In a very short time the indications increase, and usually (as we have said, with full blooded, feverishly disposed horses, at a time of high temperature) before the twentieth day, absolute madness sets in. He

now rubs the bitten part against anything convenient with increased violence; sometimes instead of rubbing he will bite and tear the wound; the eyes assume a wilder and more unnatural appearance; some patients neigh squeakingly, shove out the tongue, or gnash the teeth. The progress of the disease is now very rapid; generally there is profuse sweating; there is suppression of the urine, and inflammation of the parts of generation; his countenance changes from a look of anxiety to one of cunning and a sort of grinning ferocity, and there is an irrepressible desire to bite man or animal—whatever living thing may be within reach; he gazes sometimes at an imaginary object and springs and snaps madly at vacancy; his propensity to destroy grows with his pain, and at last he wreaks his fury upon inanimate objects—the manger, or trough, the rack, whatever is seizeable in his stall is torn to pieces with his teeth or smashed with his feet; if not confined he darts ferociously at whatever object of attack may present itself; plunges about like a demon of destruction, snorts, foams, sometimes uttering a kind of crying neigh, and perhaps beats himself to death before the last and comparatively helpless stage comes on.



DESTRUCTIVE IMPULSE OF HYDROPHOBIA.

If not destroyed before the disease has run its course, paralysis, usually confined to the loins and the hinder extremities, sets in, and involves with it all those organs which depend for their nervous influence upon the posterior portion of the spinal cord. Unable to stand upon the hind legs, the animal will sit on his haunches, and strike and paw with his fore feet. The suffering is sometimes rendered more terrible by tenesmus or retching of the bowels, which seem dreadfully oppressed but have lost the power to act, while the kidneys are fevered and torpid and the urine cannot be voided.

It sometimes happens that the disease is developed by exertion and heat, when no previous indications have been manifest, and shows itself in a peculiar manner. The horse stops all at once in his work, heaves, paws nervously, trembles, staggers and falls. In a moment he will be up, and may, if put to it, proceed for a few moments, when he will stop, stare about, and lie down again. This stage is sometimes mistaken for blind staggers, but it may be distinguished by observing that in blind staggers the horse loses his senses, while in hydrophobia he is always conscious, often acutely intelligent and observing.

What to do.—This is a disorder of so dreadful and dangerous a character that some of the ablest veterinarians do not hesitate to advise the instant killing of the sufferer; and they refuse to give any directions for attempting a cure. When the furious stage has come on there seems to be a sort of demoniac maliciousness and treachery, with a watchful cunning, that makes it hazardous for friend or stranger to trust himself anywhere within reach. It is extremely doubtful, too, whether recovery ever takes place after the madness is developed.

Yet, it is not improbable that much may be done in the way of prevention after the bite has been inflicted. The first step is to check the flow of blood from the part, if possible, to prevent the rapid spread of the poison over the system. If a limb has been bitten, this may be done by tying a handkerchief around it, above the wound, and twisting with a stick until a sufficient degree of compression is had. Then cauterize the wound thoroughly, making sure that the very deepest recesses of every tooth print or lacerated place is reached. Lunar caustic is best, because most easily and surely handled; but if impossible to get a stick of this, any convenient caustic may be applied, as oil of vitriol, nitric acid, caustic potash, butter of antimony, etc.: or, a small iron, not too sharp, heated to a white heat and cleaned of scales, will answer if the animal can be kept still enough to apply without danger of injuring him otherwise. The handkerchief should be left on tight until the cauterization is effected.

Cauterizing thoroughly, even two or three days after the injury, may result in saving the animal, as the absorption does not always speedily take place.

If the wound is upon a part that forbids the use of the handkerchief, it may be cut open to its depth, and a freer flow encouraged, both by the larger opening and by squeezing and wringing—soaking, meanwhile, with warm water. Then use the lunar caustic wherever a sign of tooth mark can be seen.

But when unobserved till the virulent stage has come on, it is not even known to science that anything can be done to save; and the best, the

most merciful thing to do is to shoot at once. When there are strong symptoms of madness, but still some doubt, put him by himself in a stable, bare of everything destructible except food and water, which must be placed where he can get it, and barricade the door. Leave a window open for observation, and keep him here until the symptoms disappear or hydrophobia is unmistakable—then act accordingly.

II. Mad Staggers.

Causes.—This disease is sometimes known by the more learned term of phrenitis (the delirium of fever; frenzy, raving); but it will be by practical men most readily recognized when treated of under its old and familiar name.

It is an inflamed condition of the brain and its covering, with effusion of the small cavities and the spaces between the membrane and the brain itself. Sometimes both the brain and its membranous covering are involved in this inflammation, sometimes but one, and that most frequently the membrane.

It may be caused by concussion of the brain by reason of blows upon the head. The brutality of a driver, which finds its gratification in using the butt of his whip upon the head of the horse, may result in a fractured skull, to be followed by slight pressure upon the brain, a speedy fever and the consequent determination of too much blood to the head, which, combined with the burning inflammation, brings on this madness, perhaps death.

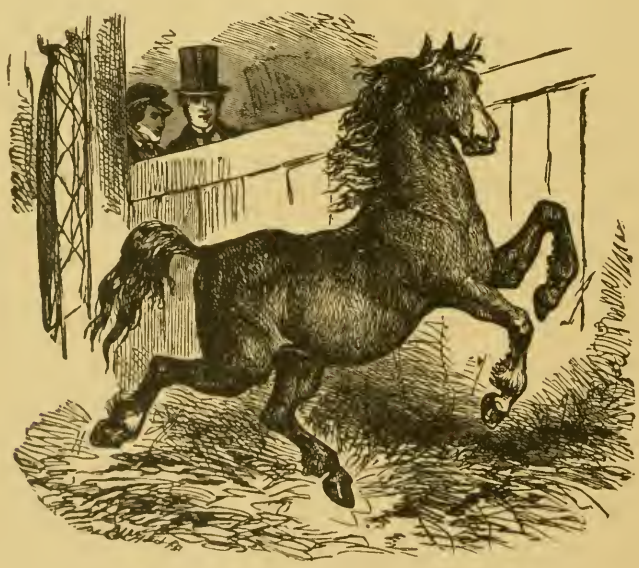
Among the causes other than violence we may name the following: The slugging of the vessels of the brain with clots formed elsewhere in the system by some abnormal action; the growth of tumors upon the brain or upon its covering, from some remote and probably hidden cause; sudden and great changes of temperature in the body brought about by instantaneous exposure to extreme heat or cold; over-exertion in plethoric or full-blooded animals, especially in hot weather; congestion from close collar, short-drawn check, or tight throat-latch; congestion from internal compression, as by over-loading stomach and bowels; feeding on parasitic grasses or smut, of which rye grass may be noted as the most hurtful; infection of the blood by poisonous animal matter or fluids; imprudent over-feeding and insufficient exercise.

How to know it.—The symptoms often differ but little from apoplexy, comparing the *first stage* of each, but they may generally be distinguished by this: that in mad staggers the horse is not so comatose, or sleepy and insensible, as in apoplexy. Light affects his eye a little, and he is sensitive to the whip, whereas the horse laboring under a genuine attack of

apoplexy seems blind, deaf, and without bodily feeling. In some instances in mad staggers, it is true, the animal may sleep till he drops, but on recovering himself he will manifest the sensitiveness above described.

Occasionally, the brain alone is involved, in which case he is stupid, dull, and awkward of motion, the nerves of sensation and of motion being both affected; and during this stage he will sometimes bore his head against some object; at others he will rest his haunches upon his trough or anything else convenient.

When the membranes covering the brain are inflamed, which is most generally the case, there is restlessness rather than stupor; the horse trembles; his general temperature is elevated, while there is great heat about the upper part of the head; his pulse is excited, his breathing quick; his eyes glare; his movements are irregular; he paws, stamps, champs his teeth; an interval of stupor may occur, but even when just aroused from this condition of repose he is extremely excitable and trembles violently.



HORSE DURING THE MAD STAGE OF STAGGERS.

When the worst symptoms are rapidly developing themselves he begins suddenly to heave at the flanks; his eyes brighten and his nostrils expand; the pupil of the eye dilates to the utmost, and stares wildly and vacantly; his breathing becomes shorter and quicker; sometimes he will neigh uneasily; his ears are erect and bent forward; the membrane of the eye reddens and contrasts strangely with the clearness of the cornea or ball; he becomes more and more excitable, and trembles at every sound, and

delirium sets in. He now dashes himself about with fury; his motions are sudden and violent, but without any disposition to mischief, as he is evidently unconscious. He sometimes becomes ferocious, and dangerous to all who may come within reach; he then bites and strikes at those who come near him; he plunges, rears upon his hind legs, whirls round and round and falls with dreadful force. He will now lie awhile exhausted, and his pulse and breathing are slower.

At length the mighty anguish returns, and he becomes again a terrifying and dangerous animal. The second paroxysm is worse than the first; he darts furiously at everything within reach; sometimes bites and tears himself; and this continues until his former stupor returns, or until he has worn himself out and death puts an end to his sufferings. Each succeeding attack increases in intensity, and brings on increased weakness, so that his periods of stupor become longer and longer till at last he dies.

In those cases where at first only the brain is involved the premonitory symptoms may continue a day or two, when the membranous coverings may become suddenly inflamed and delirium speedily set it. Whenever the membranes are attacked the disease reaches its crisis in a few hours — there must be speedy relief or death will quickly follow.

This disease may sometimes be mistaken for colic or for hydrophobia; but to distinguish from the former, notice that in the colic the horse rises and falls with less violence, and that though he sometimes plunges, he more frequently rolls about. He looks frequently at his flanks with an expression of pain, and he is all the time conscious. To distinguish it from hydrophobia, observe that while there is violence in the latter, and generally an inclination to do mischief, there is always consciousness.

What to do.—If the earlier symptoms—stupidity, sleepiness, awkward, staggery motions—are observed, apply ice cold water to the head, both by pouring and by means of a sponge or rags secured between the ears and along the forehead; and bleed severely—not enough, however, to render the horse faint. Then give an active purge, as the bowels will almost invariably be found to be torpid and constipated. Use at first:

No. 145. 7 Drachms aloes,
4 Drachms castile soap,
6 Drops oil of caraways.

Mix with mucilage or syrup to form a ball, and give this quantity for one dose. If this is found, after four hours, not to have produced the desired effect, give one scruple of *croton meal* in water, if he will drink it; if not, he must be drenched. This is a powerful medicine; but it is of the utmost consequence that his bowels be free, and no effort must be spared to effect that object. If the croton cannot be had, resort to the clyster (of warm soap suds), or to back-raking.

The bowels having been opened, give two or three times a day, the following compound, the effect of which is to decrease the action of the heart and prevent the tendency of the blood to the head, as also to promote the activity of the urinary organs:

No. 140. 1 Drachm digitalis,
1 ½ Drachm tartar emetic,
3 Drachms niter.

Keep him in a cool, airy stall, and feed with the greatest moderation, giving such green and moist food as has a laxative tendency, and such quantity only, for a few days, as will prevent gnawing hunger.

But if the paroxysm has already come on when remedial means are to be adopted, seize the first opportunity, during an interval of stupor, or of comparative stillness, to bleed him till he falls, or, if down, till he grows faint and weak. Open the vein on both sides of the neck, if possible, as the quickness with which the blood is drawn away from the brain is of almost as much consequence as the quantity. The operator must observe great caution, as the fury may return suddenly and with much danger to himself.

If successful in bleeding, the next step to take is to purge in the least possible time. To affect this, use *half a drachm of croton meal.* Sometimes the horse will drink readily and freely, in which case the meal can be well stirred in water and given in that way; but if necessary, pour it down him according to directions for drenching. If the meal of croton cannot be had instantly, give *an ounce of aloes* dissolved in hot water. If this does not act within four hours, give a quarter of an ounce more, and so continue till purging is produced. The next step is to give as a sedative the digitalis or powdered foxglove, etc., as previously directed. It may be necessary to back-rake and then give a clyster of warm soap-suds.

All this will of course leave the creature in a dreadfully depleted and weak condition; but the only hope of saving him lies in the use of powerful means, especially when delirium has already set in. It may not be possible in every case to bring him back to fullness of life and usefulness, even with the best of care. At all events, he must be treated gently thereafter, and guarded from excitement, as the attack is otherwise likely to recur.

III. Blind Staggers.

Causes.—This disorder, by some called megrims, by others vertigo, and still by others dizziness, is not well understood; and there is a difficulty in determining whether some of the forms it assumes ought not to be set down as separate diseases. The causes, however, that will produce

certain manifestations in one horse will produce different ones in another, so that it may be readily inferred that the varying symptoms do not mark different types of disease but mere difference of degrees; and that the same general causes act throughout.

The *immediate* cause is clearly pressure on the brain, resulting from unusual flow of blood to the head. This is doubtless in some instances the result of a constitutional tendency—a predisposition to epilepsy—that is brought to manifest itself on occasion of excitement, over-exertion, or general ill condition of the digestive apparatus. In others it is most probably a watery suffusion of the brain—the blood being subjected to some sort of decomposition in its passage through the head and leaving the serum or watery portion to collect there.

The brain requires a proportionately far greater amount of blood than any other organ; but while ample means are provided for supplying it, nature guards against doing this with that velocity which would endanger it by overloading and rupturing. The arteries make their way through the head in a peculiarly circuitous manner, and they enter through minute bony holes that will not admit of much distension. When the horse is overheated, however, or when the return of the blood is impeded, this fullness takes place. In great heat the arterial passages are enlarged to their utmost capacity, and the rapidity with which the now uncommonly heated and the thinner fluid makes its way into the brain is not counterbalanced by a similarly rapid return, and the effect is produced to which the various names referred to have been given. Impeded return of the blood from the extremities, through the veins, is caused by a tight collar, pressing, during the act of pulling, upon the large or jugular vein, on one or both sides of the neck; by a tight throat latch, producing a similar compression of the jugular; or by a check-rein drawn so short as to bring down the head, and bend the neck to the extent of crowding its parts together and interfering with the circulation. By this compression, though the blood may not be forced to any undue arterial activity, the large veins will be too long distended by reason of the sluggishness of return, and the small veins running through the substance of the brain will be so increased as to press upon the nerves at their points of origin and produce loss of power and of consciousness.

The immediate cause, or pressure upon the brain, is doubtless sometimes to be found in tumors, arising from blows on the head, as well as in congestion, or too great fullness.

Other remote causes besides those already named may be found in a diseased stomach and intestines. Inflammation of all the organs of digestion and secretion may be brought on by the retention of great masses of indigestible food, and this clogged state superinduces conges-

tion by a sort of internal compression, and this tendency is of course increased by rapid exercise and the consequent heat. That this is one of the primary causes is evinced by the fact that constipation attends nearly every case. Indigestion and foul stomach are the natural results of confinement in hot and badly aired stables, unwholesome food, or food in excess of the quantity required by the amount of daily exercise, of extreme cold, of extreme heat, and of great fatigue. Hot weather, when the horse is of full habit, will sometimes derange the digestive functions, and undue exercise will then quickly develop a case of blind staggers.

Draft horses, and particularly those that are young and of a plethoric or full blooded tendency, are most subject to it, though it is not confined to any age. It is rarely the case that a horse under the saddle is attacked with it.

The dread of the whip, combined with the consequent fretting and interference with both the digestive and circulatory functions, is thought to produce it in sensitive horses.

It is ordinarily regarded as an incurable disease. If there is an organic predisposition to epilepsy, entire recovery is of course out of the question; and when a horse has been once attacked, though previously free from any such tendency, he is subject to a return of the complaint because the vessels have been weakened by violence, and offer less resistance to the rapid flow of blood in the arteries, or the abnormal gathering of it in the small veins of the brain.

How to know it.—In its final manifestations it is unmistakable; but the careful and intelligent owner ought to be able to detect some symptoms of an appoaching attack in time to guard against its most hurtful effects. That condition of body which superinduces congestion by internal compression and derangement is not difficult to detect, and attention to this may be the means of warding off a violent attack. This is indicated by an offensive breath; somewhat impeded respiration, or expelling of the air from the lungs; chewing food slowly, perhaps letting some of it fall from his mouth only partly masticated; a foul tongue; a dry and clammy mouth; disposition to plunge his head into the water above the nostrils when drinking; fæces (or dung) hard and difficult to pass; and urine ejected in small quantities.

As previously observed, the attack very seldom comes on while the horse is ridden, but while he is being rapidly driven, or after he has been subjected to a long, hot pull under a tight collar, a closely-drawn check rein, or a throat-latch buckled almost chokingly.

Occasionally the attack will be sudden and without the slightest warning; he will fall almost as though shot, or make an effort to run around

and then fall; usually he will first exhibit some signs of uneasiness, as shaking the head and twitching the ears, and the eyes, if observed, will be found to have a wild, staring and bloodshot appearance. Sometimes he will stop and stare about—look wild and irresolute—and then go on as though nothing were the matter. Again, he will rear up or stagger like a drunken man, and then fall. He often becomes stubborn, and will go only his own way—evidently unconscious—and then come convulsions, followed by insensibility.

When down, it occasionally happens that he lies in this insensible state at first, but he usually struggles violently, then becomes quiet; gradually recovers himself, and gets up, ready to proceed on his way—being yet dull, however, and evidently affected by what has happened.

EXPRESSION CHARACTERISTIC OF MEGRIMS.

What to do.—When it is discovered in time that he is suffering with disordered digestion and is constipated, relieve him from work, if possible, and lessen the quantity of dry food.

Turn him out at night, at any rate, even if found imperatively necessary to have his services during the day. If he can have some continued rest, and the run of a good pasture, or else be well fed with food suitable to his condition, and well watered, while occupying a roomy, dry and well-ventilated stable, his chances for restoration to health and escaping violent attacks altogether, will be greatly increased. Of course he should have sufficient exercise, but in moderation. If the animal is young, and of full habit, yet fallen into this disordered state, restrict his diet, increase his exercise by degrees, or turn him out to pasture until his normal condition of stomach and bowels has returned.

In the beginning of this treatment as to diet—what may be called the *preventive* treatment—give him the following purgative:

No. 147. 7 Drachms aloes,
4 Drachms castile soap,
6 Drops oil of caraway.

Mix with mucilage or syrup sufficient to form a ball. This amount constitutes a dose. It may be repeated after twelve or fifteen hours if the first does not produce proper action.

But if these premonitory symptoms pass unobserved, or if it is a case of sudden attack owing to violent exercise, great heat, or development of epileptic tendencies, stop him, if driving, upon his showing any of the indications described, and go to him; examine collar, check-rein, throat-

latch, and see that all is right; pat and soothe him, and allow him to stand for a few moments in quiet. Where it is found that the collar has been pressing the neck veins see that it is altered without more ado—either by cutting or by pressing in against the breast on the lower part of the collar a cloth of sufficient size to prevent its tightening upon the sides of the neck. If he recovers sufficiently to be driven, allow him to move at a very moderate pace; if not, remove him from the vehicle and lead him home. When there he must have rest and quiet, and care must be taken, as previously directed, to bring him, by food and laxatives, into a good state as to stomach and bowels.

When the attack is so violent that he rears, plunges, and falls, bleed as soon as he becomes composed enough to allow it—taking from the neck vein from three to six quarts, according to the violence of the fit, and the weight, fullness, and fleshiness of the patient. During the first paroxysms of his attack dash cold water over his head, if it can be had; and a wet sponge made fast between his ears will be found useful.

From these violent attacks, entire recovery is doubtful, even though he may not die outright; but every chance of even a partial return to health and usefulness is increased by rest. A horse once affected in this way should really not be driven again, though apparently recovered, for the fit is likely to recur, and the driver may himself be thereby seriously endangered.

The necessary steps as to feeding and care, and the administration of laxative medicine have already been pointed out.

IV. Apoplexy, or Sleepy Staggers.

Causes.—The different stages of this disease are sometimes treated as though they were two different types; and we find even professed veterinarians, who ought to be more discriminating, so regarding them. Apoplexy is the term by which alone it should be known—the state of sleepiness and staggering being but premonitory symptoms, or rather the earliest stage.

The *immediate* cause of this disorder, as in blind staggers, megrims, vertigo, giddiness, dizziness, or by what other name the disease previously treated may be known, is undue pressure upon the brain, and their remote causes are generally identical also—the difference in the diseases being simply a difference in the modes of their manifestation.

Post mortem examinations of horses that have died of apoplexy, have sufficiently indicated the cause. The vessels of the brain are found to be peculirly bloated or distended with black blood. Sometimes there may be no inflammation of the membranes of the brain, but the stomach is found loaded with undigested food or the intestines with foul matter. It

is clear that congestion of the brain, perhaps of the venous system generally, is the condition that prevails when the disease manifests itself in its active and violent stage. And this too great fullness of blood is in most cases owing to disordered digestion, which may be brought about in two ways: the horse may be overfed and subjected to insufficient exercise, so that the stomach becomes weak, and lacks the power to digest or expel the food; or he may suddenly gorge himself when chancing to come upon abundance of food of which he can partake without restraint. The fulness of the stomach and bowels produces that internal compression which precludes the regular flow of blood through the veins, and weakens the venous system, and the brain soon becomes overcharged, and that, too, with a fluid in a degree poisonous for want of perfect oxygenation, or purification by being regularly passed through the lungs and exposed to the air. Hot weather is peculiarly favorable to the attack, both because of the more debilitated state of the system from heat, and because the heat predisposes a more rapid arterial flow of blood, that is not counterbalanced by an equally rapid return of the blood through the veins to the heart and lungs.

Luxuriant pasture, warm weather, and the dependent posture of the animal's head in his continual cropping, especially if he is in over-condition and full of blood, may readily produce apoplexy—the immediate and the remote cause in this case seeming to act simultaneously. Horses in poor condition may be attacked after having been overworked and reduced to a debilitated state through want of care and of nourishing food. Put upon rich pasture, with a ravenous appetite, they are apt to gorge and bring on indigestion and its attendant constipation.

There is sometimes a softening of the brain, rather than effusion or too great fullness, and this may arise from tumors, caused by blows, or by the plugging of the vessels with clots of fibrous matter.

How to know it.—This differs from blind staggers or megrims in this, at least, that the prevailing symptoms force themselves upon the attention of the ordinary observer while the horse is at rest. He exhibits at first a want of appetite, and is more than usually dull. When he walks his movements are slow and unsteady. Examination will discover his pulse to be slow, heavy and dull, yet full. When he is exercised a little these symptoms go off, but they soon return when he is left to himself, and more unmistakably. In the open air he balances himself as though about to fall, and stands with his head depressed. In the stall he bears upon the trough or the wall, and a good deal of his weight seems to be supported in this way. Sometimes he gets his head against some rest, stands for a length of time, and then drops as though shot, but presently gets upon his feet again, to relapse into the same sleepy listlessness.

When in this condition it is dangerous to be near him, or to attempt to move him. When aroused from this apparent sleep he looks vacantly around, glares unmeaningly, and sometimes the eyes will not close when an object is moved before them—and the indications are that he neither sees nor hears. If food is within reach he will sometimes take a mouthful, but lose consciousness while it is yet but half chewed; and if he attempts to drink, the power of swallowing seems to be partially lost, and the water will return through his nostrils. As he grows worse he will twist his legs over each other when trying to go straight forward. In the last stage he begins to foam at the mouth; his breathing becomes loud and laborious; the pulse is depressed; the jugular veins are distended almost to bursting: the muzzle is cold, and sometimes he discharges fæces almost involuntarily; he grinds his teeth; twitchings steal over his face and limbs; and at last he falls into convulsions and beats himself about in a terrible manner. There is no disposition to do mischief—he is evidently well nigh unconscious. All the powers of life are wrought upon, and death speedily results unless some powerful means can be brought to bear to bring instant partial relief.

It is well to caution the reader against mistaking for an apoplectic sign a certain sleepy, listless, stupid expression of countenance that is brought on by repeated attacks of megrims. A little examination will generally disclose that all the other symptoms of apoplexy are wanting.

What to do.—That treatment which will most speedily relieve the overloaded vessels of the brain is clearly best. If anything is done before the violent stage of the disease comes on, bleed freely from the neck vein—so freely, indeed, that the horse falters or begins to blow. If the case has been neglected until the violent stage is upon him, bleed, if possible, until he falls. It may sometimes happen that a lull in the paroxysms ensues, and even at this late hour it is well to make the attempt to save by drawing blood.

Next, determine, if possible, whether the cause is a present-existing gorged stomach, and constipated, torpid bowels. If so, use the stomach pump promptly. Force warm water into his stomach till the food is so thinned that it may escape by the pylorus and by the mouth and nostrils. When this extreme fullness of the stomach is overcome, give a purgative bolus as follows:

No. 148.
7 Drachms aloes,
4 Drachms castile soap,
6 Drops oil of caraway.

Mix with mucilage or syrup to form a ball, which give as a dose.

If the constipation is obstinate, and does not yield to this purgative,

stir a handfull of fine salt in one gallon of warm water, and inject it into his bowels. This failing he must be back-raked.

When the system is once relieved the digestive functions may be stimulated by giving, every four hours, for two days, a wine-glass-full of

No. 149.
4 Ounces fluid extract of black pepper,
6 Ounces fluid extract of ginger,
2 Ounces hyposulphate of soda,
4 Ounces water.

Dissolve the soda in the water; then add the ginger and pepper.

Attention must now be paid to diet, at first reducing it to a small quantity, and to such in quality as will have a laxative tendency. He may be turned upon a pasture, if it is not too rich, but he should have food administered morning and evening in moderation. He should have free access to water.

In the beginning of the paroxysm it is sometimes found advantageous in quieting him somewhat to apply ice to his head, or to pour a stream of ice cold water steadily between his ears.

Until he is so far recovered as to render it safe for him to go to pasture, keep him comfortable. If the weather is hot—and it usually comes on during hot weather—keep him in a cool, well-aired place, or in an open place well shaded.

Complete recovery is seldom to be hoped for. Generally, the horse once severely affected, is useless for Summer work, though well able to go through that of Winter, if properly cared for.

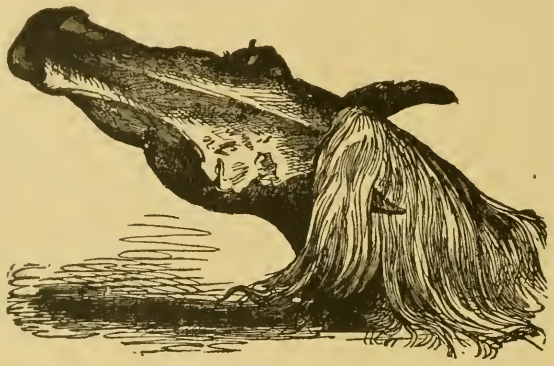
As in the blind staggers, the unnatural distension of the blood vessels renders a recurrence of an attack very probable; and it may be brought about by external compression, so that tight collars, tight throat latches, and short-draw check-reins, should be avoided. A breast-strap should be substituted for a collar, and overwork should be specially guarded against.

Apoplexy is not contagious, though it has been so regarded. If more than one horse on the same farm or in the same stable is affected with it, be assured that the same causes are present for both, and that when they are removed the danger of new cases ceases.

V. Abscess Within the Brain.

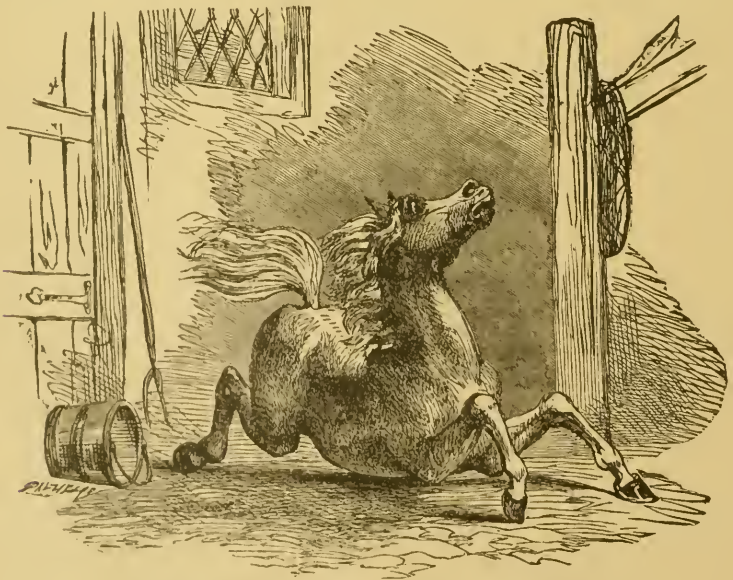
This not unusual and terrible affection is produced almost invariably by external injury. From being struck or striking against some hard substance, as in running away, striking the head in the stable, or other similar cause. It is possible the owner may know nothing about it. A

wound, perhaps a trivial looking one, is found on the head, from which perhaps only a little watery fluid issues. Soon the horse becomes dull, and from day to day gets worse, refuses his food, and at last falls and commences knocking his head against the floor or on the ground; thus he continues until at length death comes to his relief.



A HORSE DYING FROM ABSCESS WITHIN THE BRAIN.

What to do.—There is nothing to be done once an abscess forms within the brain. The only means of cure is to allow the matter to escape. The thick muscles covering the cranium of the horse would prevent the use of



A HORSE, MAD FROM INFLAMMATION OF THE BRAIN.

the trephine, and if, indeed, a hole was made through the skull to the brain, and perchance the abscess cured, who would want the horse?

There is but one sensible way: kill the suffering animal and end its misery at once.

Another terrible affliction of the brain, fortunately not common, is inflammation of the brain, or phrenitis. It is indeed madness, with the exhibition of terrible strength, which no human power can cope with to successfully relieve, in its frenzied state.

If discerned in its earliest stage, before violent frenzy attacks it, resort may be had to bleeding. Open both neck veins and allow the blood to flow until the dull, heavy, listless expression brightens or the animal sinks. Bleed again if necessary. Give 8 drachms of aloes, and repeat at the end of three hours, if the bowels are not thoroughly relieved, or the pulse changes for the better. Afterwards give 20 to 30 drops of tincture of aconite, or half a drachm of the powdered root infused in a pint of hot water, or a drachm of digitalis, infused in the same way, to be given cold every half hour until relief is obtained. In ninety-nine cases out of a hundred, however, relief will come in death.

CHAPTER XI.

DISEASES OF THE MUSCLES AND TENDONS.

I. BLOOD SPAVIN.——II. BOG SPAVIN.——III. CURB.——IV. THOROUGH PIN.——V. TETANUS, OR LOCKJAW.——VI. CRAMPS.——VII. RHEUMATISM.——VIII. STRING HALT.

I. Blood Spavin.

This may be defined as a distension, or enlargement (dilatation) of the veins of the hock joint, and overlying the seat of bone and bog spavin; a local venous congestion, caused generally by swelling, impeding the flow of the blood, and often connected with bog or bone spavin. It is harmless; in fact it may be considered as accompanying, or the result of other disease of the joint.

What to do.—In the early stage cold water perseveringly applied, followed by cooling lotions, equal parts of alcohol and rain water, or one pint of brandy to one-half pint of water, applied as a lotion. If this does not relieve the difficulty, use a strong infusion of bayberry bark, using considerable friction by hand rubbing with either of the remedies named.

II. Bog Spavin.

Common bog spavin is technically (as is windgall) an enlargement of the Bursa Mucosa, just as a distension of the sub-cutaneous (beneath the skin) veins in the region of the hock is called blood spavin. These cause an undue secretion of joint oil and a dropsical effusion into the joint, producing swelling having all the character of inflammation of the true hock joint. This inflammation of the upper or principal hock joint is true bog spavin.

Causes.—Overwork, sprains, injuries either from punctured wounds, fractures or bruises; also from the effects of rheumatism. All produce inflammation of the structures of the joint.

How to know it.—In its acute early form there is a tense, puffy, fluctuating swelling of the front and inside portion of the hock at the upper or principal point just where usually there is a depression. There is also a swelling behind, where thorough-pin occurs, but it can be pressed forward, the anterior (front) swelling filling up; but there is no swelling below and behind the hock as in thorough-pin.

What to do.—Absolute rest and the use of a high-heeled shoe. Continued pressure on the swollen parts, by means of a truss or compress, with cold water applications, or brandy and salt.

In case there is much inflammation reduce it by means of fomentations of water, and if there is pain let the fomentations be an infusion of hops. In the later stages use tincture of arnica diluted with water. If the case is a bad one, when the extreme heat and tenderness has subsided a blister may be applied, since it sometimes goes on to ulceration of the joint, and even to bony deposit destroying all movement of the joint. See No. 160 and 161 for blisters. (Pages 423, 424.)

III. Curb.

This is a swelling in the middle of and just behind the lowest part of the hock joint. At first it is soft and doughey, or retaining for a time the shape of the pressure, producing an enlargement about two inches below the hock. Curby hocks are also sometimes congenital and hereditary.

Causes.—A blow, but more frequently a sprain of the tendon, or of the sheath through which the flexor tendon passes. The ligament of the hock when injured increases the gravity of the disease.

How to know it.—There is heat, inflammation, tenderness, lameness, and a tendency to knuckle forward at the fetlock.

What to do.—Absolute rest, a high-heeled shoe, and cold water bandages will generally remove the difficulty if applied in the early stages of the disease. If, from neglect, the lameness becomes decided, apply the following:

No. 150. 1 Ounce powdered bloodroot,
1 Ounce turpentine,
4 Ounces acetic acid.

Apply night and morning for a week or ten days and afterward bathe daily with vinegar

If coagulable lymph forms, threatening callosity, (a hard swelling) daily and long-continued friction—hand rubbing downward—and the application of a more decided stimulant will be indicated. If so, prepare the following:

No. 151. 1 Ounce oil of cedar,
1 Ounce oil of majoram,
1 Ounce oil of sassafras,
1 Pint soft soap.

Use this daily, rubbing always downwards.

IV. Thorough Pin.

Causes.—This is a sprain of the flexor tendon behind the hock, and which has a large sheath which extends both above and below the joint—a dropsical enlargement of the sheath of the tendon, so the fluid contained may be pressed from one side to the other. Hence its name.

How to know it.—Pressure on one side will cause bulging on the other, and pressure on both sides will cause fluctuation along the tendon below and behind the hock.

What to do.—Use the same treatment as for curb; cold water bandages, or hot fomentations in the early stages of the disease; also absolute rest and a high-heeled shoe. When tenderness ceases and lameness is gone, apply a spring truss, so the pads will clasp and cover the puff on both sides, and exert a pretty firm and steady pressure. Success in removing the puff has occasionally been had by puncturing the lower part of the swelling, into the sack, and injecting a solution of the following strength:

No. 152. 10 Grains sulphate of zinc,
1 Ounce rainwater.

Inject one or two tea-spoonfuls, as the case may require. Then bring the walls of the sack closely together and hold them so for a week by means of a firm flannel bandage.

Another plan is to apply with gentle rubbing, the following ointment every day until the skin is inflamed:

No. 153. 1 Part biniodide of mercury,
7 Parts neats foot oil.

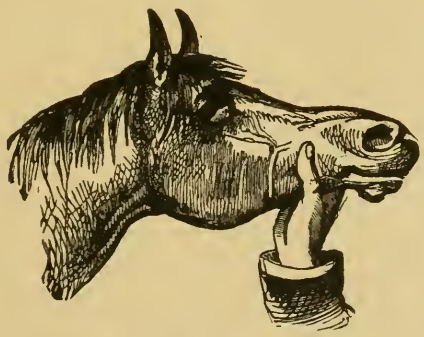
Rub together, either in a mortar or with a spatula on glass, until intimately incorporated, and use as directed, observing regularity and shunning violent handling.

V. Tetanus, or Lockjaw.

This terrible affliction, which consists of persistent and often acutely painful drawing together (cramps) of the voluntary muscles, causing extreme rigidity, drawing together the whole muscular system, and closing or locking the jaws.

Causes.—Often a wound in the leg or foot, seemingly of the most trivial character, as the prick of a nail. It is also produced by castration nicking and docking; by hard riding or driving, and leaving the animal shivering in the night air. When it proceeds from a wound, it is called trumatic: when from no apparent cause, it is called idiopathic. It rarely occurs from wounds until they are well advanced toward being healed; though it may display its symptoms immediately upon or a month after the hurt, but generally from the sixth to the fourteenth day.

How to know it.—In the earliest stages there will be stiffness and rigidity of the muscles near the injury, and the limb will be moved with difficulty. There will be excitement, the ears will be pointed forward, the head elevated, the legs stiff and stretched out; the horse will seem excited and yet obstinate to move; the tail will quiver and the skin and flesh will feel hard like a board. The lower jaw being taken in the hand and the head raised, if the haw projects over the eye, you have a case of lockjaw. See cut.



THE TEST FOR TETANUS.

What to do.—Give the animal a loose or box stall, and in the most quiet place possible, and where it will see no one except the attendant. Place slings beneath him so he can stand clear of them or rest in them at will. Remove all straw, litter or other sources of excitement, and avoid all noise or unusual movement. Keep the stable darkened and without other animals present. If the disease is produced by a wound examine it, and if contracted or containing pus (matter) widen it, and cover with

a bread and milk poultice containing laudanum or extract of belladonna.

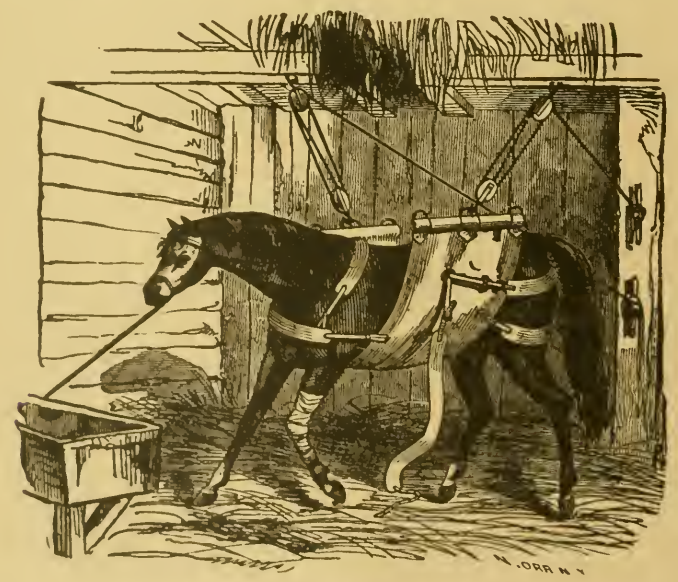
Give a powerful purgative, as the following:

No. 154. 6 to 8 Drops croton oil,
4 to 6 Drachms powdered aloes.

Dissolve in a pint and a half of water and give as a drench. If it cannot be given by the mouth administer it through the nostrils by means of a stomach pump and the horse catheter, to be hereafter shown, in feeding; or prepare the following, if the horse can swallow a ball:

No. 155. 4 Drachms powdered aloes,
4 Drachms extract of gentian,
1 Scruple croton farina.
Mix with linseed meal and molasses into a ball.

Follow this up with three doses daily of anti-spasmodics, as, one to two drachms belladonna, or one-half ounce chloral hydrate, or one-half to one ounce dose of tincture of lobelia in a pint of water. Give by the mouth if the animal can swallow; if not, as an injection. Keep the bowels open with one drachm podophyllin and two drachms extract of belladonna, smeared on the back of the tongue.



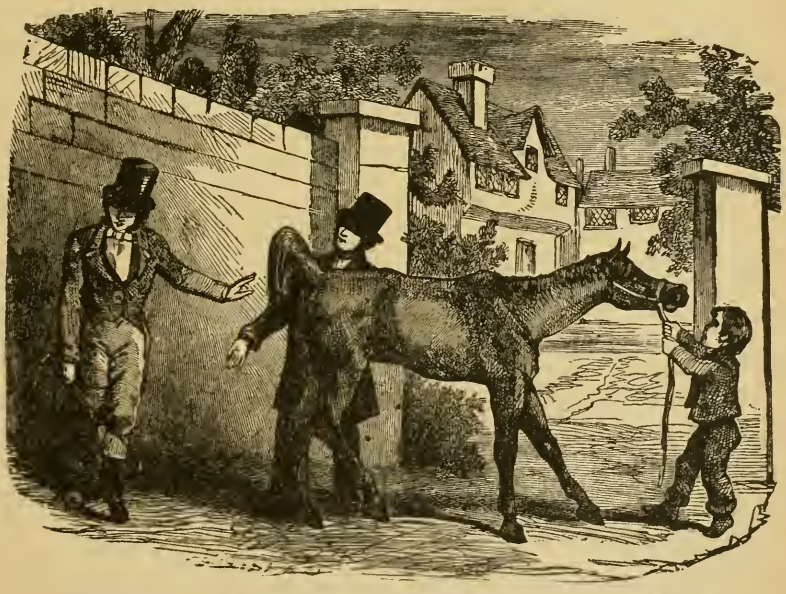
SLINGS FOR TETANUS, OR FOR FRACTURED LIMB.

If the animal can bear it, a thorough sweat with a blanket wrung out of hot water, and covered with dry blankets will do good. Feed with nourishing gruels if the animal can swallow; if not, feed as next described.

Attach a horse catheter to a stomach pump, pass the end carefully up the nostril and into the gullet as shown. If coughing is produced, withdraw the catheter and commence anew. If two feet are inserted without

MODE OF FEEDING HORSE HAVING CHRONIC TETANUS.

alarming symptoms, pump in only a quart of linseed gruel, if the horse has fasted for some time, and as the stomach can bear it, give more. This, however, must not be attempted while the disease is in its acute form (its earlier stage), but after the disease assumes a chronic form it may be resorted to.



SHOWING HOW FAR AN ANIMAL WITH TETANUS IS CAPAPLE OF MOTION.

The disease is apt to leave the animal in a most deplorable condition, and it will be a long time before it becomes serviceable, if indeed it ever

does. Six weeks or even two months may be required before the animal regains the use of its powers. The cut annexed will illustrate the condition of a horse with tetanus.

It will thus be seen that in a decided case it will be policy as well as humanity to seriously consider whether it may not be better to relieve the sufferings of the poor animal at once by shooting through the brain.

VI. Cramps.

Some horses are quite subject to cramps of the muscles and tendons. It may be an irritability or spasm of a particular muscle or set of muscles, which refuse to act, becoming stiff and inflexible. They cramp and sometimes twitch excessively. This is again succeeded by another stage in which the muscles relax and are restored to their normal condition.

Causes.—Strains, bruises, or over-taxation of the powers. In many cases it is undoubtedly allied to rheumatism, a disorder attacking horses much oftener than is supposed; rheumatism very often being attributed to bots, founder and various other causes by the ignorant. Both diseases are quite painful, and leave the animal very sore, and rheumatism often for months.

What to do.—Clothe the body warmly, find the seat of the difficulty by feeling of the parts until the sore place is touched. Wash the parts with salt and water, and rub dry. Then apply the following liniment:

No. 156. 1 Part solution of ammonia,
1 Part spirits of camphor,
1 Part olive oil.

Rub it in well, and hold a hot iron or brick to the parts to heat it thoroughly.

VII. Rheumatism.

This is a peculiar form of inflammation attacking the fibrous structures of the body, such as the joints, tendons, ligaments and muscles, and is accompanied by stiffness, exceeding tenderness and pain, shifting from place to place, often implicating the valves or other structures of the heart, and when so usually results in death.

Causes.—Exposure to cold, wet or drafts, especially when the system is overworked. There is usually a constitutional predisposition in the subjects, and in such it is easily brought on by diseases of the respiratory or digestive organs, especially in horses of a full, gross habit.

How to know it.—In its acute form there is dullness, followed by ex-

treme lameness in one or more of the limbs. There is tenderness and then swelling of the joint, tendon or muscles, at first soft, then hard. There may be fluctuations from excess of synovia (joint fluid). With the inflammation there is fever. The pulse is full and hard; the mouth is dry and clammy; there is hurried breathing, scanty urine and costiveness.

In the chronic form the symptoms are the same as in the acute, but not so pronounced, and in this form it is unattended with fever. It may appear only upon undue exposure, or in damp, lowery weather, and disappear again upon the recurrence of fine weather. Chronic rheumatism is also less inclined to shift from place to place.

What to do.—For rheumatism in its early acute stage relieve the bowels by laxative medicines, say four drachms of aloes. Put the animal in slings, as for tetanus, and clothe him from the hoofs to the ears in flannel. If practicable the first thing is to fill the box in which the horse is kept with steam, keeping it up for an hour. If the pain is extreme lessen it with ounce doses of laudanum.

Give the following three or four times a day as a drench in a pint of gruel:

No. 157.
1 Ounce bicarbonate of soda,
1 Ounce Salicylic acid.

If this cannot be obtained, give the following, at a dose, night and morning:

No. 158.
½ Ounce powdered saltpeter,
1 Drachm powdered colchicum,
1 Ounce oil of turpentine,
Mix in half a pint of linseed oil.

For rheumatism in its chronic form the following will be found to be valuable, used internally:

No. 159.
1 Ounce powdered carbonate of potash,
1 Ounce powdered saltpeter,
2 Drachms iodide of potash.

Give in one and a half pints of water.

As a liniment for the joints and other affected parts, to be afterwards wrapped in flannel, the following is excellent:

No. 160.
1 Pound compound soap liniment,
2 Ounces liquor ammonia,
2 Ounces tincture cantharides,
2 Ounces laudanum.

Rub in with as much friction as the horse can bear, and apply until

signs of blistering are apparent. If this does not produce the desired effect, use the following:

No. 161.
½ Ounce laudanum,
½ Ounce camphorated oil,
1 Ounce tincture cantharides.

Apply to the joints with a soft brush, but without friction.

A soothing and stimulating embrocation, when so severe measures as the foregoing are not considered necessary, may be made as follows:

No. 162.
1 Part spirits of camphor,
1 Part solution of ammonia.
1 Part olive oil.

Mix, and apply by rubbing it in.

VIII. String Halt.

String-halt is the sudden jerking up of a hind limb, sometimes both in succession. Sometimes several efforts will be made before the animal can progress at all. In other cases the spasmodic action of the hind leg is shown in starting off, and the animal becoming warm, it will nearly or quite cease. An exceptionally bad case is shown in the illustration given below.

A HORSE HAVING STRING HALT.

Sometimes the action is so slight as to be almost unnoticed, and again it may be so strong that the hind leg will strike the belly.

Causes.—The causes are unknown. It is supposed to be produced by a variety of injuries, but principally as a reflex nervous action. It increases with age and hard labor, and nervous excitement, and is a positive unsoundness.

What to do.—There is no cure. Rest, keeping the bowels open with 2 drachm doses of belladona daily, will lessen the spasms for a time; but fatigue or nervous excitement is sure to bring on a recurrence of the attack. A careful driver will often prevent the disability being much shown by being careful not to excite or overwork the horse.

CHAPTER XII.

DISEASES OF THE EYE.

I. NATURALLY WEAK EYES. —— II. SORE EYE-LIDS.—— III. MOON EYES. —— IV. CATARACT. —— V. INFLAMMATION OF THE HAW, OR HOOKS, —— VI. DIMNESS OF VISION. —— VII. WORMS IN THE EYE.——VIII. PURULENT OPHTHALMY.——IX. FUNGOID TUMORS IN THE SUBSTANCE OF THE EYE. ——X. IMPEDIMENT IN THE LACHRYMAL DUCT.——XI. GUTTA SERENA.

I. Naturally Weak Eyes.

Very many persons, otherwise well informed, when from any cause the eyes of horses become weak, inflamed, watery, or drop tears, suppose the cause to be from a natural weakness of the sight. So "blind teeth" are supposed to cause serious trouble, and even blindness in horses. Nothing could be further from the truth. It is exceedingly rare that horses have naturally weak eyes; it can almost always be traced to some local cause. Thus, watering of the eyes is caused by a stoppage of the lachrymal ducts leading from the eyes into the nostrils, the natural channels for carrying off the superabundant moisture of the eye. Inflammation of the eyes is not uncommon from a turning in of the eye-lashes. The remedy is to snip them off with the scissors.

"Blind teeth," or "wolf teeth," as the immature supernumerary tushes are called, do no injury whatever. If it is feared they may, it is easy to take them out with a pair of forceps, or to knock them out with a punch and hammer.

Occasionally a supernumerary tooth may be found growing in the upper jaw, between the first and second teeth, and lapping over both of them. This is considered by many persons as producing inflammation of the eyes. It is true that if pain results, the eyes may be affected by sympathy. This tooth should always be removed, and may be done with a strong pair of forceps. It may cause distress from pain in the jaw; nothing more.

Colts are often subject to inflammation of the eyes in a slight degree, during teething. Examine the teeth, lance the gums, and the eyes will recover. It is a case of sympathy.

II. Sore Eye-lids.

In the outset of more serious disease, soreness of the lids of the eyes is common. It is also produced by irritation of various kinds. In inflammation of the eyes, soreness of the lids is always present. If from other disease, it is sympathetic, and will pass away with the disease itself.

There is one form, however, that is characterized by a redness, swelling and itching, the edges becoming raw and exuding matter. This must have specific treatment.

What to do.—The horse should have a laxative dose if the bowels are not in a natural state. The following will be indicated:

No. 163. 1 Drachm flowers of sulphur,
2 Drachms powdered mandrake,
3 Drachms powdered aloes.

Form into a ball with honey, and give as a dose.

To reduce the inflammation, make a curd, by beating three eggs thoroughly and then stirring them with a quart of filtered rainwater until mixed; let it come to a boil, stirring occasionally. Add half an ounce of sulphate of zinc, and continue the boiling for a few minutes. Bind the curd over the eyes, by placing a portion between layers of thin muslin. The clear water strained through several thicknesses of fine linen is excellent for sore or inflamed eyes of any kind. Wet the lids three or four times a day.

In aggravated cases that will not yield to treatment, and that remain raw and exude matter, the edges should be carefully touched with mercurial ointment, the utmost care being taken that it does not come in contact with the eye.

During the whole treatment the horse must be tied up by two lines to the rear posts of the stall, so he cannot rub the eyes, and must be fed from a nose-bag.

III. Moon Eyes.

This is ophthalmy, recurring at periodic times, or at intervals of three weeks, a month or more, and not, as is often supposed, at the full moon.

Causes.—Hereditary predisposition; from malarial causes; herding in low, damp situations; rheumatic affections; irritation consequent on

teething, and, in fact, where predisposition occurs, from any cause tending to lower the general state of the health.

How to know it.—There will be a sunken look to the eye; the haw of the eye will protrude; the white of the eye may be of a pinkish cast; the eye will be watery; the pupil of the eye will be cloudy, at the edges, and dull and discolored at the center; there will be haziness, milkiness, or a whitish spot may appear, which will continue to overcast the eye. In the intervals between the attacks the transparent coat of the eye will have a hazy, bluish cast about its border, and the iris will lack its natural brightness; the upper lid or eyebrow will be wrinkled or furrowed.

What to do.—Look first of all for carious or defective teeth, and if found extract them. There is a strong sympathy between any difficulty with the teeth and the eyes, though unsound or "wolf teeth" do not, as was once supposed, cause blindness.

Place the animal in a darkened stable; give four drachms aloes, and apply the following lotion twice a day:

No. 164. 20 Grains acetate of lead,
20 Drops belladonna,
1 Quart filtered rain water.

Alternate this twice a day with the following:

No. 165. 20 Grains sulphate of zinc,
20 Drops tincture of Calabar bean,
1 Quart filtered rain water.

The physic having acted, give two or three times a day the following.

No. 166. 1 Drachm sulphate of iron,
½ Ounce powdered Peruvian bark.

Mix in one quart of warm water, or give in the feed if the horse will eat it. When another attack is expected double this dose.

Sometimes an ounce daily, for several weeks, of Fowler's solution of arsenic will be serviceable, intermitting a few days occasionally. If, however, the attacks recur, and at lessened periods, the trouble may be expected to end in cataract and blindness.

IV. Cataract.

As a rule, cataract is the result of inflammation of the deep structures of the eyeball (internal ophthalmy or the periodic form). It also occurs occasionally from diabetes and other constitutional disabilities.

How to know it.—Put the horse in a dark place. Take a lighted candle. Three images will be reflected, one from the surface of the eye,

one from the front surface of the lens, and one from the rear surface of the lens. If in moving the light either of the posterior images are changed into a white haze, there is exudation into that part of the lens; in other words, a cataract is forming.

What to do.—Unless the cataract is only just forming the horse will be eventually blind. Give aloes as recommended for moon-blindness, and also the prescription for lotions in that case. Follow this up with digitalis in doses of fifteen to twenty grains daily, alternated daily with six to eight drachms of niter in the water taken. Keep the animal in a dark room; apply blisters to the cheeks and behind the ears, using the following, well rubbed in:

No. 167. 2 Drachms powdered cantharides,
¼ Ounce lard.

Mix thoroughly and rub well in, treating the blisters when formed with linen cloths covered with mutton tallow to keep them running.

Apply also to the eye daily for several months the following:

No. 168. 2 Grains phosphorus,
1 Ounce almond oil.

Mix and keep in a dark, cool place, in a bottle with a ground glass stopper.

V. Inflammation of the Haw, or Hooks.

The haw is a triangular shaped cartilage situated just within the inner corner of the eye. In health but little of it can be seen. Its use is to pass over the ball of the eye to remove dust or other offensive substances from the eye. This is done so quickly that it is difficult to distinguish the action. Its play may be seen by opening the lid of the eye, or by attempting to touch the eyeball with the fingers.

Causes.—This is often produced by inflammation or swelling of other parts of the eye. It may end in producing a hard, bony state, protruding from its place as a whitish lump. When it presents this appearance some persons are fond of cutting out the "hooks" to keep the horse from "going blind." Our advice is, "*Don't do it.*"

What to do.—If there is inflammation and swelling, treat the eye as for ophthalmy (inflammation). In all cases of inflammation of the eyes use the bandage as shown in the cut on next page.

If the inflammation is slight, but active, keep a linen cloth over the eye, or eyes, saturated with the following:

No. 169. 4 Ounces sassafras pith,
1 Quart rain water.

Let it stand three or four hours, and apply cold, straining it as used. If the inflammation is more pronounced, use the following as a lotion:

No. 170. 4 Drachms laudanum,
2 Drachms extract belladonna,
1 Quart rain water.

MODE OF BLINDING A HORSE, AND APPLYING LOTION TO THE EYE.

Also raise the eyelids and swab the inflamed haws occasionally with the egg and sulphate of zinc lotion recommended for sore eyes. If the lachrymal duct is closed, that is, if water runs from the eyes, swab out the ducts well up the inside of the nostrils with weak tobacco water, finishing with clean water, or use the sulphate of zinc in the form of a lotion.

If the blood vessels are overloaded, leeching the lids of the eyes will be beneficial, and in extreme cases half a gallon to one gallon of blood may be taken from the neck vein, to be repeated at the expiration of ten days, if necessary.

The inflammation having subsided, the haws will resume their natural place and appearance, and again become almost invisible.

VI. Dimness of Vision.

Very many horses have defective vision. Some do not see well at night; some are near-sighted; some are far-sighted, as in man, from too great convexity of the eye, or the reverse. Old horses gradually acquire dimness of vision.

There is no specific for defective eyesight. Spectacles would relieve the difficulty, but, spectacles that might be worn by a horse have not yet been invented, and for the reason that they are not practical. He must get on as best he may.

VII. Worms in the Eye.

This is occasioned by a worm (*Filaria Oculi*), and may be extracted by a skillful puncture. It should only be undertaken by a competent veterinary or other surgeon, the horse being first securely hampered so he cannot struggle.

VIII. Purulent Ophthalmy.

Purulent Ophthalmy is confined to the conjunctiva (mucus membrane of the eye), and it is in this membrane that the redness and ordinary swelling of the eyes have their seat. The eyelids are much swollen, and the membrane rises up, puffy and red above the level of the cornea (the transparent disc), sometimes in fungoid excrescences. This species of inflammation is epidemic, and when occurring often, goes through the stable.

What to do.—Place the animal in a moderately dark stable, keep the eyes wet constantly—by means of the cloth shown in the cut with inflammation of the hooks—with the following:

No. 171. 2 Drachms sulphate of zinc,
20 Grains morphia,
1 Pint rainwater.

Use the water tepid if possible, but if used cold at first, it must be so continued, and *vice versa*.

The bowels should be kept moderately open with physic if necessary, or with soft feed, and the same general treatment used as for the other forms of ophthalmy.

If the disease does not yield to this treatment, and becomes chronic, prepare a wash as follows:

No. 172. 6 Grains nitrate of silver,
1 Ounce distilled water, or rainwater filtered through sharp washed sand.

Mix, and drop a little into the eye, daily, from a quill.

IX. Fungoid Tumors in the Substance of the Eye.

This is a rare affection, and fortunately so. The causes which produce it are obscure, but probably the same as in any other cancerous affection. The end will probably be death, for the taint of the cancerous affection is probably in the system. Upon close examination, the eye ball may be clear, but a brilliant yellow substance may be seen at the base of the interior.

If it be not deemed best to destroy the animal, the eye must be extirpated. Two knives are required, of a peculiar shape, one of small size and slightly bent to one side; the other larger and curved to one side until it nearly reaches the shape of a semi-circle. A sharp scalpel (the knife ordinarily used in surgical operations) will also be required. Two straight, triangular pointed needles threaded with strong waxed twine, a

curved needle, similarly threaded, water, a sponge, lint, injecting tube and a bellows.

Cast the horse, and fasten him so he cannot move. Pierce each eyelid with one of the straight needles and tie a secure loop for raising and holding the lids as shown in the cut.

EXTIRPATION OF THE EYE.

Let an assistant then hold the lids wide open. The surgeon with the straight knife quickly describes a circle around the globe of the eye, severing completely the conjunctiva mucous membrane of the eye. He then takes the small, curved blade, and passing it through the divided conjunctiva it is carried around the eyeball close to the bone, severing the levator and depressor muscles. The cornea is then pierced with the curved needle, in and out, the thread drawn and a loop fixed. Then the eye being drawn out as far as possible the curved knife is passed around the rear of the eye with a sawing motion, the integuments are severed, and the eye is drawn forth.

It is quickly done when all things are ready, but should not be attempted except by a competent surgeon. Some bleeding will follow. Inject cold water; if this do not check the hemorrhage, force cold air into the cavity with the bellows. If this do not avail, plug the cavity softly with lint, bandage the wound to secure the dressing, and leave the result to the natural process of healing.

X. Impediment in the Lachrymal Gland.

The lachrymal ducts of the eyes are small canals leading from the eyes into the nose. Their use is to convey away the superfluous moisture (tears of the eyes). When it is closed by inflammation or other tempo-

rary cause, the water of the eyes flow over the face as shown in the subjoined cut.

OBSTRUCTION OF LACHRYMAL GLAND.

Occasionally, however, the duct becomes permanently closed. The usual remedy is to swab the nostrils where the duct enters with weak tobacco water and afterwards with clear water.

If this do not effect a cure after two or three trials, the duct must be opened with a probe.

The duct commences by minute openings near the terminations of the upper and lower lids at the inner corner of the eye. It comes out upon the dark skin which lines the commencement of the nostrils, lying on the inner membrane.

A delicately thin elastic probe must be used, and about twelve inches long, the horse being cast and securely fastened. It may be necessary to introduce the probe both from the corner of the eye and from the nostril. Next charge a fine pointed syringe with tepid water and placing the point into the nasal termination of the duct, force the water through. The operation should only be performed by a surgeon.

XI. Gutta Serena.

This is sometimes called glass eye, incorrectly, however, as the term is understood in the West and South. In glass eye, as understood there, the pupil is sound and perfect, the iris distinct and natural, but has a white ring around the cornea. It may injure the sale of a horse, but simply from the singular expression it gives the eye of the animal.

True gutta serena, or *Amaurosis*, is palsy of the nerve of sight, or of the nervous expansion called the retina, and due to functional and organic disease of the optic nerve. In the early stages of the disease it may sometimes be relieved, but is likely to occur again. In the later stages it is incurable.

Causes.—Congestion, tumors, dropsy or other diseases of the brain. Also by injury to the nerve of sight, by pressure or other cause, from inflammation, excess of light, and may be symptomatic, from indigestion or during gestation.

How to know it.—In the early stages the insensibility of sight may be only partial; the pupil will be unnaturally large; upon closing the lids of the eyes, and opening them in a strong light, there will be little or no variation in the pupil; the eyes will be unnaturally clear from extreme dilatation; the animal will be partially or totally blind, as shown by high stepping and failure to flinch when the fingers are suddenly pointed close

to the eye; the ears will be in constant motion as a compensation for the want of sight.

What to do.—If from overloading the stomach, indigestion, gestation, etc., turn the animal upon grass, if in the season; or clothe warmly and feed upon easily digested food, as mashes and roots. If the attack is recent and from such cause as inflammation of the brain, bleed to the extent of a gallon, and put a seton close to the eye. In fact the cause must be found and removed, if it be due to one that can be removed. Success is sometimes had by blistering as for ophthalmy. Use in connection with this nerve stimulants. Of these strychnia, in one to two grain doses, according to circumstances, or five grain doses of nitrate of silver may be given.

EYE AFFECTED BY SERENA.

Sympathetic amaurosis may admit of cure. As we have said, the deranged function must be restored.

If medicine is required to deplete the system the following will be good:

No. 173.
2 Drachms powdered gentian,
4 Drachms powdered aloes,
1 Ounce common salt,
1 Pint warm water.

Give as a drench, and keep the animal on light mashes with an occasional injection of salt and water if necessary.

If there is debility alteratives and tonics will be indicated:

No. 174.
1 Ounce powdered golden seal,
1 Ounce powdered gentian,
1 Ounce powdered sulphur,
1 Ounce powdered ginger,
1 Ounce salt,
1 Pound oatmeal.

Mix, divide into twelve parts and give one in the feed—of good, generous diet—night and morning.

As a lotion for bathing the eye the following is recommended as a good astringent:

No. 175.
1 Ounce powdered bayberry bark,
1 Pint boiling water.

Let it stand until cool. Strain through a close linen cloth, add a table-spoonful of tincture of bloodroot and bathe twice a day.

CHAPTER XIII.

DISEASES OF THE BONES.

I. BIG HEAD AND BIG JAW. — II. SWEENY OF THE SHOULDER. — III. SWEENY OF THE HIP. — IV. BONE SPAVIN. — V. ENLARGED HOCK. — VI. RING-BONE. — VII. STIFLE. — VIII. SPLINT. — IX. SORE SHINS (INFLAMMATION OF THE METACARPAL BONE). — X. ROTTEN BONE. — XI. INFLAMMATION OF THE KNEE-JOINT. — XII. CARIES OF THE LOWER-JAW.

I. Big Head and Big Jaw.

Causes.—This disease, called also *exostosis of the bones*, is manifested in an enlargement or bony tumor on the face, on a line between the nostril and the eye. It finally breaks out in small holes, which discharge a thick pus, and at last ends, if not treated opportunely, in a complete decay of the bone. The bone continually enlarges, and cells or channels are formed as the minute bony plates become thinner and thinner, till the structure can be easily cut with a knife or crushed with the fingers. The interstices are filled with a red, bloody mass. In some cases the ligaments and tendons are separated by decomposition of the bone, and crumblings, dislocations and fractures take place for want of firm attachment for these supporting ligaments.

The primary cause of the disorder is not known; but the tendency is believed to be transmitted. A horse manifesting signs of the big head is generally diseased not alone in the bones of the face, but the whole osseous system seems to be to some extent involved, so that there is not infrequently a soreness of the limbs and a lameness accompanying it. The immediate exciting cause is most probably defective nutrition—a want of that power of assimilation which is necessary to the supplying of the bones with their phosphate constituent.

It may be developed by both over-feeding and by deficiency of food, as

the digestive functions are deranged by either excessive burdens imposed upon them or want of sufficient nutrition in that food which *is* digested.

It is difficult to assign any reason why the general predisposition should be determined primarily to the face.

It has been observed to prevail mostly in those regions where Indian corn is constantly fed, and in those, whatever be the predominant food, where the animal uses only, or chiefly, free stone water—a fluid lacking in that phosphate element so essential to bony structures.

Hard labor and abuse, poor food and bad stable management, doubtless do much to precipitate the disease.

How to know it.—Before the visible swelling of the face there will generally be evident weakness, loss of appetite, laziness; a slight suffusion of the eyes with tears—one or both according as one or both sides of the facial bone is affected; then a swelling, about half way between the eye and the nostril, small and hard, but gradually increasing in size. If the swelling is pressed upon with some force the horse will wince with pain, but gentle rubbing seems to give ease. The lower jaw, under the chin, will next appear thickened; a degree of general stiffness sets in; at last the joints are swollen, and seem puffed up with wind; the horse rapidly fails in flesh; and the head becomes enormously swollen, and finally breaks into little openings which discharge an offensive pus.

What to do.—It is well, perhaps, to warn the reader in the outset *not* to do any of those foolish things which characterized the old practice, such as boring into the diseased part and injecting corrosive poison; laying open the jaw and sawing out a portion of the bone; blistering, burning, etc. The disease is not local, but constitutional, and though perhaps having no other visible manifestation than on the face, it has extensive connection with various portions of the frame, so that purely local treatment is of little consequence.

The first step will be to see that the patient is well stabled or otherwise cared for according to the season of the year, and put upon a systematic course of food, drink, and moderate exercise in the sun. Give him from five to seven quarts of oats per day, and if these are boiled and mixed with a little wheat bran, all the better. When green vegetables can be had, they should be fed liberally, to counteract a sort of scorbutic or scurvy tendency which marks this disorder. Apples, beets, carrots, turnips—whatever fruit or vegetable you can get him to take is good. When seasonable, put him upon a bountiful pasture.

Give the following in eight doses, night and morning, with such food as he will most readily eat:

No. 176. 2 Ounces chlorate of potash,
4 Ounces powdered ginger.
3 Ounces gentian,
2 Ounces podophyllin,
6 Ounces poplar bark.

Give also with the food, once daily, 2 ounces phosphate of lime.

Rub upon the swelled face with moderate vigor, twice daily, the following preparation:

No. 177. 6 Ounces spirits of camphor,
4 Ounces cod liver oil,
2 Ounces oil of cedar,
1 Pint diluted acetic acid.

If the case has been neglected until there are already breaks in the skin, and exudation of matter, adopt the previously described course, with this exception, that the part must be thoroughly cleansed with warm soap and water, and then, instead of No. 177, apply the camphorated corrosive sublimate every other day for six or eight times, then omit three days, and begin again, and so on until the skin shows signs of healing. Apply the sublimate with a little mop of soft rags, and dry it in with a hot iron held near the part, or pressed smoothly over a layer of intervening cloths, thick enough to prevent actual burning.

II. Sweeny of the Shoulder.

The common effect of all lameness and disease of a limb is a wasting of the muscles connected therewith. Therefore in all sprains entailing inflammation and continued disease of a limb, and in all injuries entailing chronic, long-continued manifestations, there will be wasting or atrophy of the muscles, and in extreme cases sometimes permanent contraction, even of the cords of the limb. This is popularly called swinny or sweeny. It is the result of disease and not the disease itself. The cause of this wasting must therefore be looked after in order to obviate the difficulty.

There is, however, from sprain of the muscle outside the shoulder blade, a tendency to waste of the muscles, to such a degree sometimes that they are so shrunken as to cause the skin to be drawn tight to the shoulder blade.

Causes.—Sweeny is usually acquired by young horses, when first put to work, from over-strain; or, it may occur in horses of any age, from hard pulling on uneven ground, by stepping into holes, etc., thus causing injury to the muscles of the shoulder, and particularly those supporting the joints.

How to know it.—Sometimes the horse may be able to walk or even trot without serious difficulty. If one stand directly in front of him there will be seen that the affected shoulder is held in an unnatural position, seeming to be rolled outward farther than is natural. There will be a peculiar motion in the gait, and heat, tenderness and swelling on the outside of the joint.

What to do.—By pressure on the parts discover the seat of the inflammation by the flinching of the animal. This found, reduce it by continued application of cold water to the part, if in the earlier stages. This may be done by folding a long blanket and hanging over the shoulder so as to cover the affected part. Over this keep a cloth continually wet with cold water, until the acute symptoms have subsided.

After these have subsided, exercise must be given every day, either by driving on a smooth road or using at any light work on smooth ground. Every effort should be made to increase the circulation over the fallen muscles by active rubbing. If the case do not yield to treatment, and there is decided wasting, the muscle being hard, use the following:

No. 178. 1 Pint ammonia,
1 Quart Olive oil.

This should be rubbed in with considerable friction, until nearly the excitement of a blister is produced. This with subsequent friction and an occasional use of the blister, will effect a cure; but it may take months of perseverance to bring the shoulder back to its perfect shape. Light exercise should be given every day.

III. Sweeny of the Hip.

The wasting of the muscles of the hip are due to analagous causes with those of the shoulder. It is, however, far more rare, since the power of the horse being in the hind-quarters, the enormous muscles of those parts act as cushions to protect the parts from injury. As a rule, the cause of the wasting of the muscles of the hip must be looked for lower down, unless the injury is known to proceed from a fall on the side.

A careful examination of all the muscles will enable the owner pretty generally to fix the seat of the disease, from the heat and tenderness of the parts. This discovered, use the means prescribed for shoulder sweeny. In old and difficult cases, either of the shoulder or hip, it may be necessary to resort to active blistering and subsequent stimulation by means of the galvanic battery. In old and confirmed sweeny that has come with a horse bought, or from neglect at the proper time, a cure will probably not be effected; but a partial restoration of the parts may be made.

Sweeny has been placed among the diseases of the bones because it sometimes proceeds from injury to the bones and joints. The difficulty itself, however, is confined to the muscles.

IV. Bone Spavin.

The definition of bone spavin may be given as an inflammation, ulceration and bony deposit of the small flat bones in the lower and inner part of the hock joint; or of both the outer and inner ones, or from inflammation of the cuniform and metatarsal bones, terminating in anchylosis (a bony union of the parts) rendering the joint stiff.

Foot, incapable of being raised from ground by reason of spavin.

Natural position of the healthy foot when raised from the ground during an easy trot.

Causes.—Injury to the joint by concussion, sprains of the ligaments, the use of shoes with high heels or calks. Hereditary predisposition to spavin is common from weakness of the joints, bones and ligaments. Consequently weak limbed horses or mares, or those with spavins, or other diseases of the bones should never be bred from.

Bone spavin is really one of the most formidable diseases with which the horseman has to deal, and the attack is sometimes so slow and blind that jockeys are often enabled to put off a spavined horse on the unwary, the horse afterwards going dead lame. Nevertheless it will show itself if the horse is allowed to cool, or is ridden into the water and allowed to stand awhile, for a horse with spavin coming on as he becomes warmed the ligaments become freer in their action, and an animal lame at first, will go well enough afterwards; yet, in the end the horse becomes permanently lame, until the deposit about the bone, called anchylosis, becomes solidified, when the joint is stiff and the lameness ceases.

Causes.—The causes producing spavin may be various. Hereditary weakness of the limbs is undoubtedly one of the principal causes. Thus a blow, a sprain, or any injury producing inflammation will cause spavin in such an animal, when in a strong muscled and fine boned animal it

would yield readily to treatment. The reason is, a feverish and unhealthy condition of the membrane secreting the synovial fluid is produced, and the firm membrane affording no outlet, it settles into the spongy bone, and a diseased condition ensues, which the weight and motion of the animal intensifies until confirmed spavin is the result. When only the splint bone is affected there is chance for recovery, but when the cube bone is affected there is but little chance for relief until the disease has run its course, and ended in a joint more or less stiff.

How to know it.—Sprains do not invariably cause lameness. There may be little or no local swelling as in occult spavin, as ulceration is called, in the center of the joint between the flat bones. The swelling, when it does exist, is in front and on the inside and on the lower part of the joint, and may best be seen by standing about midway of the body so as to get a side view of the front of the hock. When the swelling is in front of the hock it is most to be feared. It is hard and is to be distinguished from the tense but elastic swelling caused by sprain of the flexor tendon, or from the flexible and fluctuating swelling of bog spavin.

The swelling of bone spavin may be more to the front or farther back on the inside of the hock, or even shown principally on the outside, and in case it extends to the true hock joint, it may end in bony formation to such a degree as to close the articulation (play of the parts) and produce a stiff joint. The animal if turned from side to side in the stall will move stiff and on the toe. This same stiffness is also seen when the animal first starts off, but which may nearly or quite disappear when the animal becomes warm. The horse will sometimes jerk up the limb as though he had string-halt. By turning him quickly in a small circle he will carry the limb more or less stiff, or rest on the toe only.

What to do.—In any case rest and a high heeled shoe should be allowed. In the acute stage or early in the development of the disease, place the horse in slings if possible. Foment thoroughly with hot water in which an ounce of laudanum is mixed to each two quarts of water. Give four drachms of aloes if the bowels are costive, and give half an ounce to an ounce of saltpeter in the water, morning and night, until a free flow of urine is had. When the inflammation has subsided blister. The following will be effectual:

No. 179. 1 Part corrosive sublimate.
12 Parts oil of turpentine,

Mix thoroughly and rub in. Firing with a white hot iron is still more effectual, yet the iron and the corrosive liniment are apt to leave a blemish. A milder preparation is:

No. 180. 2 Drachms oil of rosemary,
½ Ounce powdered cantharides,
4 Ounces mercurial ointment.

Grind thoroughly together and rub on heating it in with a warm iron. If there is simply swelling, in old cases, thorough and frequent rubbing with oleate of mercury will dissipate what swelling has not actually become bone. Setons are also most valuable in spavin. The needle should be passed for a considerable space under the skin, over the seat of spavin. Anoint the tape with the following:

No. 181. 1 Part powdered white hellebore,
8 Parts lard,
Mix with gentle heat.

Before the application of either blister or seton we would advise thrusting a narrow-pointed bistoury under the sprain and scarifying the parts. In no event, however, should resort be had to cutting away the bony parts which have formed, with mallet and chisel, as we have seen them. It is barbarous, inhuman, and can do no good whatever. Some cases will absolutely resist all and any means for cure; others again will yield kindly in from one to three months. In young horses if treatment be given in time, a cure may generally be effected. With old horses the cure is difficult.

V. Enlargement of the Hock.

Nature has protected the hocks in a most ample manner, to prevent injury under ordinary circumstances, and in fact, under exceptional circumstances, except those of an accidental or violent nature. From various bruises or strains, inflammation and lameness may ensue. Rest and fomentations will generally set this right if taken early. Sometimes, however, the enlargement will continue to grow in spite of all efforts to the contrary, and until the entire joint is involved.

How to know it.—There are two forms of this disease. In one, the tendons and cartilages only are affected. This will generally yield to fomentations and a few applications of oleate of mercury. If not, blister, using the prescription No. 180. Another form is more serious. From a severe blow or other cause, there is a bruise of the bone, by which the investing membrane, called the periosteum, is either severely strained or torn loose, giving rise to inflammation and formation and deposit of bony matter on the surface of the bone, sometimes to such a degree that the parts are of excessive size, and the leg so lame that it is only with great difficulty the animal can walk. The animal may, indeed, as in the case

of bad spavin, be capable of doing farm work even with a stiff leg, but is totally unfit for driving on the road.

What to do.—Precisely the same treatment must be pursued as in the case of bone spavin. Fomentations, while in the stage of fever or inflammation, and blistering, firing and setons to assist absorption. It must be remembered, however, that either in spavin, or any other disease of the bones, joints, cartilages, or muscular tissues, that straining of the parts is likely to ensue again, and consequently care must be taken about overworking or injuring by fast driving, especially on rough ground.

VI. Ring-bone.

This is a deposit of bony matter above and below the coronet of the foot, just where the hair begins above the hoof, or of the bone of the hoof, as the coffin bone is called, or bony growth on the pasterns.

Causes.—It is caused by heavy work, hard pulling by draft horses, bruises of the bone by pounding of the feet on hard roads and pavements, generally beginning as inflammation of the membranes covering the bones, and at these points giving attachments to the ligaments at the side of the lower or small pastern bone, or of the lower end of the upper or large pastern. Sometimes the bony formation proceeds to such an extent, involving and covering the whole surface, as to produce a kind of club foot.

How to know it.—There may be lameness or not, except on hard ground, or upon binding the limb, in old-seated ring-bones. During the beginning of the evil, or while there is inflammation, and a tender, elastic swelling, and a more or less doughy state (engorgement) of the soft parts. In the course of the disease this matter becomes hard, from being turned into a soft or spongy bony formation. The swelling may be scarcely seen and confined to the sides of the pastern bone, or there may be great enlargement of the whole surface. If the trouble occurs in a fore-leg, the heel is put down first; if the ring-bone is in the hind-foot, and in the sides or back part of the pastern, the toe will be put down first.

What to do.—For the fore-foot, put on a thin-heeled bar shoe. If in the hind-foot, a high-heeled shoe. That is, if the animal walks on the toe, use a high-heeled shoe; if on the heel, a thin-heeled shoe. If there is inflammation, known by heat and tenderness, use fomentations of hot water, perseveringly applied until it is reduced. Then blister severely with the following:

No. 182. 10 Drops muriatic acid,
20 Grains corrosive sublimate,
20 Grains camphor,
1 Ounce oil of turpentine.

Mix, and apply until a sufficient blister is formed; then wash off to prevent blemish and keep the blister running as long as possible, by covering with a rag well smeared with mutton tallow. Blister again if necessary. Or, use the means pursued in spavin, oleate of mercury, if the case is not difficult.

If the ring-bone has been of long standing, the only relief will be the growth of bony matter over the joint. There will be more or less stiffness in the joint, but the horse may do slow work. Old horses are more difficult to cure than young ones, and in any case to avoid blemish, the case must be taken at the first indication. Then thorough fomentations, slight blistering, a proper shoe and rest will accomplish a cure. If there is simply a hardening of the integuments, oleate of mercury, in developed ring-bone or spavin, will reduce so much of it as is not already bony growth.

VII. Stifle.

Any difficulty of the stifle joint, by which the animal is more or less disabled from the use of the limb, is by the generality of horsemen termed stifling, it being supposed to be a dislocation of the stifle bone, corresponding to the knee-pan in man. Dislocation, however, is extremely rare. The displacement of the whirlbone of the stifle joint when it occurs, will cause the animal to throw the limb straight out behind. This form often becomes chronic; that is, occurs, and the habit is fixed from apparently slight causes, or any cause that shall compel the animal to throw the leg back farther than is usual in going at a slow gait. It is often produced in the first place by catching the hind leg or hoof in something which forcibly holds it.

How to know it.—The horse will hold the leg extended out behind, the head will be raised and the animal will go on three legs; there is every evidence of extreme pain, but no heat nor swelling. Upon examining the stifle bone, the patella, corresponding to the knee pan in man, will be found outside those against which it should fit. When the dislocation is inward, the limb will be drawn upward.

What to do.—Get the animal into a close place; have him held firmly by the head; pass a rope about the fetlock and over any projection, so the limb may be drawn forward. Bring the limb forward and upward, and standing behind and against the hip, press the bone toward and into

its place. Hold it there firmly until the muscles regain their original contractibility in some measure, and use an infusion of bayberry or oak bark, cold, freely, for some days.

In addition to this it is better that the horse be made to stand on the injured limb. To do this it is usual to tie a cord tightly about the other hind leg. This is apt to make a blemish. Tie the other foot so it cannot be thrown back.

In nine cases out of ten when the owner supposes his horse to be stifled the difficulty will be found to be from injury to some other part of the limb, as sprain of any of the ligaments of the leg, of the fetlock, a prick of the hoof, etc., causing the animal to hold the limb in such a way as to cause the stifle bone to seem displaced.

Horses often injure the parts around the stifle joint by running, leaping, or from bruises or other hurts. In this case the treatment is to be the same as in any other sprain or bruise. In mild cases the following will be found good to bathe the sprain or bruise with:

No. 183. 1 Ounce tincture of arnica,
1 Pint rain water.

Bathe the affected part freely with this from time to time. If the difficulty is severe, fomentations of hot water must be perseveringly used until the inflammation subsides, and then resort may be had to blistering if necessary, or a seton may be placed under the affected part to get up counter irritation. In severe cases the cure is slow and the animal must have absolute rest.

In any difficulty in or about the stifle joint, it is well to examine carefully for wounds or bruises.

A wound of the parts will often cause intense pain, and to the uninitiated, apparently all the symptoms of dislocation. The veterinarian is never deceived, and no one need be if he brings common sense and a careful examination to bear upon any wound, bruise, strain or other injury. There will be blood, matter, swelling or heat in the part affected. This found, use the remedies prescribed in such cases.

VIII. Splint.

Causes.—The name is given to a peculiar enlargement generally found on the outside of the small bones of the fore leg, and inside the leg. The causes are not well defined. Splint may be caused by violent blows or other injuries, but it seems to be more a consequence of weight and strain. The inner splint bone, or small bone of the leg, is placed nearer the center of the body than the other, and there is at almost all times greater weight upon it, while on certain occasions it may also be subjected

to more violent strain, whence inflammation may set in, and a bony deposit result. Raising the outer heel of the shoe more than ordinarily, contributes in some degree to produce an unnatural strain upon this bone. The term splint is applied also to those bony tumors that sometimes appear on the outer shank bone. These are more readily accounted for, as this part of the leg is peculiarly liable to blows and other injuries.

How to know it.—In the first stage of the disease, while the splint is forming, there is inflammation of the periosteum or bone-covering membrane; there is lameness; and though no swelling may yet be visible, you can discover it by passing the open hand down the side of the leg, with the thumb on the small bone, or rather in the groove formed by the two small bones. A small, hard swelling will be found, which, being pressed upon, will cause the animal to flinch.

When the tumor is well-developed and plain to the sight, it is not generally attended with lameness, from the fact that the periosteum has accommodated itself to the new formation, and the inflammation, with consequent soreness, has subsided. Then it happens that a very little splint will often cause more lameness than one which is so large as to be easily seen at a distance.

In cases of much inflammation and extreme soreness, the horse stands resting the toe upon the ground, with the leg slightly bent; and this great heat may extend itself by sympathy to the soft parts of the leg nearest the splint, but this is seldom the case.

Sometimes the animal is apparently free from all trouble when merely put to a walk, but will discover extreme lameness in trotting—the extra concussion producing much pain, and examination, as previously directed, will disclose the seat of the trouble.

What to do.—If the protuberance is small, and there is no lameness, do nothing, unless the horse is valuable and the tumor is unsightly. It will disappear by natural absorption as the animal increases in years, provided there is no directly exciting cause constantly at work. An unskillful attempt to cure will sometimes lead to lameness and an increase of the splint.

If it is a recent formation, and treatment is thought necessary, observe whether the irritation is such as to have produced extreme tenderness of the part, and swelling of the soft parts of the leg. If so, lessen the inflammation, and thus also the soreness, by cool, softening poultices, or frequent application of cold salt and water. Then shave the hair off from over and around the protuberance, and rub in, at evening, the following mercurial ointment:

No. 184. 1 Drachm biniodide of mercury,
1 Ounce lard.

Continue this until a free watery discharge is produced from the surface. As a general rule this is sufficient, for even though it may not directly disappear, it will gradually do so from this time, unless the tumor interferes materially with the ligaments or tendons.

If it is large, or near the joint, or extends so as to destroy the motion that naturally exists between the two small bones, cast the horse, and secure him from violent struggling—then scarify the periosteum or membrane covering the bone, over the splint. For this purpose, have a small, probe-like knife, shaped like a scimiter, with the cutting edge on the convex side. Make a small opening about an inch below the splint, turn the little probe knife flat and insert it into this opening and urge it forward until the point has passed over the protuberance. Now turn the cutting edge down, and scarify the periosteum well, making several cuts across the splint, and with such force as to reach the naked bone every time. Withdraw the knife and insert a seton needle, with tape fixed as usual; pass the point up past the splint, send it through the skin, and draw the tape through. Slightly enlarge the upper end of the tape, so that it cannot come out below, and the work is done. Suppuration will ensue in from seven to fourteen days; absorption will follow, and the splint will almost invariably disappear.

During treatment the horse should be kept from work, as any considerable exercise, particularly any straining in harness, or concussion by rapid motion, will increase lameness and render cure more tedious and difficult.

IX. Sore Shins—Inflammation of the Metacarpal Bones.

This is an inflammation of the membrane covering the shank bones, and is not confined to any particular classes of horses, though racing or other fast worked horses are more subject to the affection than are draft horses, the difficulty generally occurring before the animal becomes mature.

Causes.—The cause is undoubtedly over-working and abuse before the bones and integuments become fully developed.

How to know it.—The lameness resembles that of splint. There is swelling over the shin bone, which is tense as though stretched, elastic, and doughy to the touch. There is heat and tenderness, and sometimes the swelling becomes excessive, and breaks, but always preserves its elastic feeling. Or the swelling may not be extensive, but gradually hardens through the formation of bony matter, until at length the pain disappears.

In these slight cases, the matter thrown out between the bone and membrane, is generally converted into a bony formation and the skin remains permanently thickened. In severe cases the throwing out of

matter (lymph) may separate the membrane and the bone, and eventuate in necrosis, or death of the bone.

What to do.—If the difficulty is not severe, cold water faithfully applied during the inflammatory stage, and later, blisters, will be all that will be necessary. In fact, treat it precisely as is recommended for splint.

In very severe cases, where there is great tenderness, and decided doughy swelling, make a series of incisions with a bistoury or narrow-bladed knife, carrying the blade a short way beneath the skin, and then cutting down to the bone. This is done to let the contents escape. Use as a fomentation hot water containing half an ounce to an ounce of laudanum to a pint, and afterwards with cold water. If the healing is not prompt, apply a blister. In a majority of cases it should yield by applying the following astringent lotion:

No. 185. 60 Drops carbolic acid,
½ Ounce sugar of lead,
2 Quarts rainwater.

It may be necessary, in fact it will be better, to give a purgative, 4 or 5 drachms of aloes, to be followed by 20 drops tincture of aconite, three or four times a day. The animal should have perfect rest and be kept on sound hay and bran mashes.

X. Rotten Bone.

This is called necrosis when it attacks the shaft or body of the horse, and caries when it is confined to the ends at its joints.

Causes.—Death and decay of the bone, from inflammation. It is liable to occur in poll-evil, founder, from cracked or broken bones, and inflammation of the membranes.

How to know it.—There will be severe inflammation, followed by one or more abscesses, which break and discharge. They do not heal, but form fistulas (pipes). The discharge at first may be thin and without smell, but after a time there is a peculiar and fetid odor, characteristic of decayed bone.

What to do.—The proper thing to do is to cut down at once to the decayed bone, scrape it clean, remove all loose portions, wash the wound with chloride of zinc lotion, made as follows:

No. 186. 40 Grains chloride of zinc,
1 Ounce distilled water.

The wound made in cutting is to be treated as is any wound. If the

cutting be extensive enough to warrant it close with stitches, cover with lint steeped in oil to which a little carbolic acid is added. If healing do not progress satisfactorily, that is if the granulations at the edges do not contract fast enough, stimulate by washing with tincture of aloes and myrrh. So far as this cutting and scarifying is concerned it should be done by a surgeon. If this cannot be done, open the fistulas clear to the bottom and wash out once a day with the following:

No. 187.

½ Ounce sulphate of zinc,
½ Ounce sulphate of copper,
1 Ounce solution of sub-acetate of lead,
6 Ounces pyroligeous acid, (or better, white wine vinegar).

To one part of this use ten parts of water, and inject with force from a syringe once a day for two weeks if necessary.

XI. Inflammation of the Knee-joint.

Inflammation of the knee or other joints may occur in all stages, from the most simple form to those most violent, with ulceration, and the formation of destructive abscesses.

Causes.—Jarring on hard roads; various injuries, such as bruises, strains, etc.

How to know it.—In light cases the horse in starting forward will do so from the knee and with pain. There will be excessive flinching if the knee is extended by force. The animal stands square on his feet, and without inclination to raise the heel. In walking he takes a fair step, but carries the knee joint as much without bending as possible, and in putting down his foot exerts the greatest pressure on the heel.

What to do.—Take off the shoes. Treat the inflammation as directed in other cases; first by hot water embrocations perseveringly applied, using laudanum as directed if necessary to relieve pain. There must be perfect rest, and if the animal will use the limb put him in slings, and apply splints and bandages to the knee. The inflammation having been cured, blister the parts, to promote absorption of the fluids. When the animal is better let him have the run of a quiet pasture until entirely sound, or keep him in the stable with gentle walking exercise every day.

XII. Caries of the Lower-jaw.

Causes.—Caries, or ulceration of the lower jaw bone, between the tushes and grinders, is caused almost wholly by the barbarous use of bits and curb-chains. Injury is also sometimes inflicted upon the bony plate of the roof of the mouth by pressure of the curb, when a tight nose

band keeps the mouth shut down. The gums of the lower jaw are very often hurt, and not infrequently the bone itself is so bruised as to result in this ulceration. When this is the case, the gum, unless forcibly opened, must slough, so that the injured portion of the bone can be cast off. Thus a stinking sore is made, and one of long continuance, as the scaling of the bone and the escape of the loosened particles is a tedious process, and attended no little suffering.

How to know it.—Examination of the gums is necessary to disclose the trouble when it exists simply as a bruise. The spot will appear of a color different from the adjacent parts, and pressure upon it will cause the animal to wince with pain. Even if neglected till there is a discharging sore, it is not always detected at once, as the discharge is, in the beginning, of a watery character, and is lost in the saliva, though constantly going on. On contact with the bit, however, there is a mixture of blood and watery matter, and some of this escapes constantly while the horse is in use. This ought to attract the attention of the master, if nothing else has, and lead to thorough examination. There will be found, in that case, a depression in the gum, and, fixed to the bottom of the cavity, a mass of proud flesh. The discharge will be characterized by a very offensive stench.

What to do.—If the bruised place on the gum, accompanied with sensitiveness to pressure, is discovered before there is any break or exudation of matter, have a strong, keen knife, and cut to the bone. The incision made ought to correspond with the extent of the bruised bone. The grating of the knife upon this sore portion will cause the horse to struggle with more or less violence, owing to the exceeding soreness and tenderness of the injured part; and this may in some sort furnish a guide as to the amount of incision necessary. If the opening is too small for the scaled bone to be easily cast out, it will be necessary to employ the bone forceps with which to grasp and withdraw it.

Upon cutting it, a thin, watery fluid will flow out. Care must now be taken to see that the incision is not allowed to close over and retain the injured bone, as this would ultimately result in a foul and troublesome ulcer.

When the discharge has somewhat thickened, and is peculiarly offensive to the smell, showing that the bone is decaying and that nature is making an effort to cast off the injured portion, wash it out with the syringe, several times a day, with the following solution:

No. 188. 1 Scruple chloride of zinc,
4 Drachms essence of anise seed,
1 Pint water.

If treatment is deferred, however, till there is an open, ulcerous gum, with the existence of proud flesh, push a stick of lunar caustic deep into the unhealthy granulation in the cavity, so as to destroy it. Then keep down the fungous growth by the use of the caustic, day after day, until the stinking discharge has ceased. This will not be until the bone has ceased to scale away; and the wound may now be safely left to heal.

A cure affected, the next thing to do is to select a bit that shall press upon another part of the mouth, or there may be a repetition of the evil. The snaffle may be used with comparative safety where the curb has inflicted serious hurt.

CHAPTER XIV.

DISEASES OF THE FEET.

I. ULCERATION OF THE FOOT (NAVICULAR DISEASE). —— II. CRACKED HOOFS.——III. HOOF ROT.—— IV. CORNS. —— V. CONTRACTION OF THE HOOF (NARROW HEEL).——VI. INJURIES TO THE FROG.——VII. FOUNDER. —— VIII. NAIL PRICKING. —— IX. CANKER.——X. SAND CRACK.——XI. FALSE QUARTER. —— XII. QUITTOR. —— XIII. TOE CRACK.——XIV. PUMICE FOOT.——XV. SEEDY TOE.——XVI. OSSIFIED CARTILAGES.——XVII. SIDE BONES. ——XVIII. INCISED AND PUNCTURED WOUNDS OF THE SOLE.

I. Ulceration of the Foot—(Navicular Disease).

Between the coffin bone and lower pastern there is a small bone which forms the projection of the heel and rests upon the frog of the foot. This bone is called the shuttle or navicular bone. The inflammation of the surface of this bone is called the navicular disease. It may implicate the synovial sac, the ligaments and the flexor tendon which plays over it. One of the uses of the navicular bone is to give increased strength to the connection between the coffin bone and the joint above. Another use is to enable the flexor tendon, which passes over it and is joined to the coffin bone, to give increased pliability, strength and motion to the foot. In high bred horses, and all those used for fast work, this bone is peculiarly liable to injury and consequently to disease. This disease is inflammation and subsequent ulceration of this highly organized bone. The difficulty may extend to the interior of the bone, to the tendon which passes over its surface and even involve the adjacent parts.

Causes.—It is thought that a rheumatic constitution predisposes an animal to this disease. Certain it is that highly organized and weak limbed animals most usually suffer from it, probably from the fact that they are not able to withstand an injury that a stronger limbed animal would do, especially when carrying a bad fitting shoe, or subject to violent exertion or over strain of any kind. Other causes than bad shoes

and concussion of the bone may exist, injury from nails picked up on the road, impaired nutrition, by which the bones are not sufficiently nourished acting to assist injury to the bone.

How to know it.—The foot will feel hot, yet particular heat is not always present. The toe will be pointed, in the stable, eight or ten inches before the other, and with the heel slightly raised. This peculiarity may indeed be noticed often for a long time before any particular lameness is noticed. By-and-by the animal will be observed to step short, and on the toe, with liability to stumble when first taken out of the stable. This will disappear as the animal gets warm, but will show again when cool. The toe of the shoe will become more worn than other parts. As the disease progresses the hoof will decrease in size, particularly in the quarters and heels. Trying the edges of the hoofs will not make the animal flinch unless there be corns, but by tapping the sole on each side of the body of the frog with a hammer, or upon the walls of the hoof about the quarters, will give pain. By bending the foot back and pressing with the thumb in the hollow of the heel on either side of the flexor tendon, with considerable force, it will cause intense pain. These are all characteristic tests. There may be sweeny of the shoulder from disease of the muscles. This is an effect of the disease and not a disease in itself.

What to do.—If the injury is new, the first thing to be done is to reduce the inflammation. Do this with cold water applications or any of the remedies advised for ring-bone, spavin, or other inflammation. Give in laxative dose, 4 drachms of aloes; have the shoes taken off and let the horse stand during the day time in pure wet clay up to the top of the hoof, and at night poultice the foot. If there is much inflammation, bleed in the arteries above the coronet. The coronet is the lowest part of the pastern, where the hair grows around the hoof. Keep the horse perfectly quiet, and if he has a fast pulse, give an ounce of salt petre in the drinking water night and morning. At the end of two weeks, or sooner if the inflammation is gone, blister the coronet all around. Or, use the following:

No. 189.

1 Ounce camphor gum,
1 Ounce corrosive sublimate,
1 Pint oil turpentine.

Grind the sublimate thoroughly in a mortar, and put into a strong bottle; pour on the turpentine and shake occasionally. It should be fit for use in from 20 to 30 hours. This is to be applied every other day to the heel and bottom of the foot, first paring away all scaly, ragged parts.

Heat it in with a hot iron. This preparation is of great strength and power and must be used carefully.

If preferred, a seton may be put in the bottom of the foot at the frog. To do this, first pare the scale as thin as possible without reaching the quick; provide a sharp, short, well-curved needle threaded with tape; pierce the sole about an inch from the toe, and bring out midway between the two parts of the frog and the hollow of the heel; or enter at the hollow of the heel and bring out the needle at the body of the frog. The utmost care must be had not to pierce deep enough to injure the tendon or bursa which lies close there. Tie the tape, and wet daily with No. 189, or the following:

No. 190. 1 Part powdered cantharides,
1 Part oil of turpentine,
8 Parts Canada balsam.

Shake the two first well together and add the balsam, shaking occasionally for 24 hours, and apply to the seton tape every day, turning it at the same time. The object in this disease is to produce suppurative running of the parts. This done, the cure is only a question of time.

If, in spite of all that has been done for relief, the disease proceeds to degeneration of the bone, resort must be had to cutting the nerves leading to the foot, (Neurotomy) which will be described in the proper chapter.

II. Cracked Hoofs.

Causes.—This is not an unusual occurrence in horses, and arises, as a rule, from weak and brittle hoofs, produced by a dry state of the hoof, whatever may be the cause, whether fever or other causes of degeneration. The prolific causes are drying of the wall of the hoof, uneven bearing of the shoe, calking or other wounds or injuries of the coronet. This crack may extend down from the coronet according to the time it is allowed to run.

CLOSING CRACK IN HOOF.

What to do.—If taken early, a bar shoe, having an even bearing all round will generally relieve the difficulty. In connection with this, apply a plaster of pitch over the injury.

If the crack becomes determined, as in the cut given, it must be kept

closed together by clinching a thin nail on each side of the gap near the bottom and top, or else with thin wire as shown in the cut.

Also burn a groove just below the crack about an inch long nearly down to the quick. It is also well to slightly blister the coronet at the top of crack. An efficient and stimulating liniment will be the oil of cantharides, made as follows:

No. 191. 1 Ounce powdered cantharides,
8 Ounces olive oil.

Mix in a strong bottle and set it in water kept near the boiling heat for three or four hours, and filter through close linen. Apply once a day with friction until the part is tender. Let the horse have rest, or turn into a pasture until cured.

III. Hoof Rot.

This difficulty, sometimes called tender feet, arises from diseases of various kinds, spavin, ring bone, chronic founder, navicular disease. There is a dry, feverish state of all the parts, and the hoof, and especially the sole, becomes decayed and sometimes perishes entirely.

How to know it.—The bottom of the hoof is dry and chalk-like, so that it may easily be dug away with the point of a knife, or even easily scraped away. The frog of the foot diminishes in size, and the ankle joints are apt to swell. The horse steps short and goes lame, if in one foot, or if in both, cripples in his gait. The affected foot will be pointed forward to enable the animal to rest on the sound foot, or if both are affected, first one and then the other will be placed forward. Sweeny or wasting of the muscles of the leg and shoulder result simply from disease of the limb.

What to do.—Remove the shoe, pare away all unsound portions of the hoof until all the pumiced parts are got rid of; also the frog and the sides of the hoof. Stimulate the bottom of the hoof by washing with No. 189 once a day for three days, heating it in with a hot iron. Then omit for two or three days and commence again. During the treatment the animal must be kept in the stable and the feet should be kept dry. When hoof rot is due to other diseases, as ulceration of the navicular joints, it will do no good to follow the rule laid down until the cause of the difficulty is removed.

IV. Corns.

Corns are in very many cases the result of other diseases, tending to weakening of the sole rather than the result of a bruise to a sound hoof.

Thus a horse with corns should be thoroughly examined for injury to the bones of the hoof, rotten hoof, etc.

Causes.—A bruise on the sole below the bars and the wall at the heel, producing a horny tumor or hardening, which presses on the quick. Sometimes there is inflammation, owing to the formation of matter which works out either at the top of the hoof or at the toe, from the formation of a fistula. Then it is Quittor. They may be found on either side of the heel, but usually on the inner or weaker side.

How to know it.—There will be flinching when the walls of the hoof and sole are seized and strained with the pincers; thus revealing on which side and the locality of the corn. The toe will be pointed, when at rest, and with the heel slightly raised. In motion the gait will be short and stumbling. If it has proceeded to suppuration, the pain will be so extreme that the horse will fear to put the foot to the ground. If there is a horny tumor forming, it may be known upon paring the hoof by the evident appearance of a white, spongy, horny formation, as in sand crack.

What to do.—If the corns proceed from other disease, causing contraction and other disabilities of the hoof, remove these causes and the corns will disappear. If the corns proceed from a simple and recent bruise, remove the shoe and rasp down the bearing surface of the heels, so there may be no pressure. That is, the heels should be rasped lower than the other bearing surfaces. If there is inflammation, let the hoofs rest in cold water, or keep them moist with a wet cloth and the sole with a soft sponge, or the whole hoof may be enveloped in a large sponge cut to fit. The animal should wear a bar shoe, arranged to avoid pressure on the parts affected. When the foot ceases to be tender, keep the hoof and sole smeared with the following ointment, to render it soft and promote healthy growth:

No. 192.
½ Ounce tallow,
1 Ounce oil of turpentine,
4 Ounces beeswax.

Use the horse at light work until entirely recovered.

If the difficulty be found to be a suppurating corn (one containing matter), the hoof must be cut down to let all the matter escape; cut away all the horn that has become separated from the quick, and pare away all the horn around the parts to a thin edge. Poultice the part with a linseed poultice, renewed until there is no longer tenderness, and the surface is smooth and healthy. Then put on a bar shoe with a leather sole, and fill the space from behind with tar held in place with a

stuffing of tow. Give entire rest and no pressure on the heel until the sole of the foot has grown out naturally.

If the corn has become a tumor it should be cut out, and the same treatment pursued as advised for a corn that has formed matter.

Old corns sometimes result in disorganization of the parts, or death of a portion of the heel, disease of the bone of the foot, or ulceration of the cartilage. In this case they must be treated as advised for Quittor or for navicular disease.

V. Contraction of the Hoof, Narrow Heel.

In a healthy condition the hoof of a horse should be nearly round. Whatever shape the hoof may assume, it is not a disease in itself but the result of disease or of some disability. It is generally the result of fever in the feet from injury to bones, ligaments or frog, or the effect of founder, etc. Contraction of the hoof exists in nearly all diseases of the feet, and may occur from standing idle in the stable. So it may result from undue paring of the heels, the bars on the frog, from a shoe remaining on so long that the foot is prevented from taking its natural growth.

What to do.—The only thing is to remove the shoes and round the edges of the hoofs to prevent their being broken or split, and keep the affected hoofs standing every day from early in the morning until late at night in puddled clay reaching well up the hoofs. Continue this for two, three, or four weeks as the case may be. Then use prescription No. 192 as a hoof ointment until the hoof is brought back to its natural shape as near as may be. In shoeing let the shoe be without bevel on its upper side, and let the bearing be equal on all parts of the wall of the hoof.

VI. Injuries of the Frog.

The frog of the horse's foot is especially liable to injury from being bruised upon projecting stones, pierced by nails and splinters. It is also liable to inflammation of the secreting membrane, resulting in the formation of matter, and to canker.

What to do.—In all bruises with soreness pare away the frog carefully until the difficulty is found. If bruised, treat it by using the liniment No. 189. If pierced with some sharp substance extract it and inject tincture of aloes and myrrh. If the difficulty be thrush, caused by exposure to wet and filth, bruise of the frog, hard substance lodged in the cleft, or other cause, there will be soreness of the skin behind the cleft

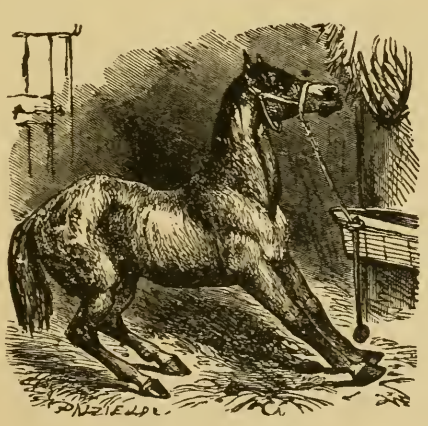
of the frog, and a bad smelling discharge from the cleft with more or less lameness.

Wash the affected parts thoroughly. Cut away all ragged surfaces and press into the cleft or wound dry calomel, or finely powdered sulphate of copper.

VII. Founder.

Founder, or inflammation of the feet, called by veterinarians laminitis, consists in fever, inflammation of the sensitive parts of the foot, including the laminæ, and of the foot bone, but is most severe in the forward portion, where greatest strain occurs when standing. Acute inflammation of the foot, or founder, differs but little in its physical manifestations from other inflammatory symptoms, except that it seems more complete and permanent. Acute founder is generally produced by overwork or overheating and exhaustion and sudden cooling, while the sub-acute form may be the result of diseases of the respiratory organs, suddenly leaving those parts and manifesting itself in the extremities.

Causes.—The disease may be brought about directly from hard work on dry, solid roads, and consequent strain on the laminæ (scale of the bones), from over-feeding or drinking cold water when warm, especially when the predisposing cause already exists. So it may be brought about by other diseases, as inflammation of the lungs. Heavy, fat horses are especially predisposed to founder, and so are those with small and deformed or large, flat feet.



ACUTE FEVER IN THE FEET.

How to know it.—There will be general fever and stiffness, and soreness; there may or may not be shivering. Soon extreme tenderness of the feet follows, generally most severe in the forward part, but soon in the heel; the pulse is strong, full and rapid; the breathing quickened,

with dilated nostrils; the intensity of the pain will often cause the animal to groan and to break out into a sweat. If pushed backward the horse will elevate the toes and throw his weight on the heels by a peculiar motion. The hoof and frog will be hot and very sensitive to pressure, and the arteries of the pasterns will beat with violence.

When the inflammation is in the hind feet, the fore feet are carried as far under the body as possible to support the weight, while the hind feet are thrown forward to bring the weight upon the heels. In either case, the animal will often lie stretched out for hours to relieve the intense pain of the feet.

Founder has sometimes been mistaken for a disease called myositis, an inflammation of the *muscles* of the limbs, especially of the hind quarters and loins. They should never be so mistaken, as an observation of the several symptoms will show.

Founder.—First one foot and then the other is lifted from the ground.

Lying down lessens the pain and the fever of the feet.

The difficulty usually occurs in the fore feet.

Myositis.—Both feet are kept on the ground with refusal to move either.

The animal will not lie down, and if thrown down the pain is increased.

Generally in the hind quarters.

In many cases the symptoms are not so aggravated as we have shown, but the symptoms, whether one or more of the feet are affected, are the same, and often, especially when repeated attacks have been suffered, leave the animal with seedy toe, pumiced feet, corrugated and otherwise distorted hoofs, and always more or less liable to recurrence of stiff spells during life.

What to do.—In light cases, when discovered early, clothe the animal warmly, give twenty drops of tincture of aconite every two hours, preceded by a gentle laxative, say

No. 193. 2 to 3 Drachms powdered aloes,
1 Ounce bicarbonate of soda.

Mix in a pint of water and give as a drench. If there is severe pain give ounce doses of laudanum every hour until an effect is produced.

As an application to the feet keep them in large warm poultices of linseed meal and water, or let the feet be placed in water kept as hot as the animal can bear. Put him in slings by all means, if they can be procured. Have the shoes carefully taken off as soon as the sedatives given will allow him to bear the pain. As early as possible the animal should be bled in the veins above the coronets of the affected feet. The bleeding will be assisted by the feet being placed in hot water, and for this reason, if for no other, the slings should be used as quickly as possible.

If there is much thirst make the drink slightly sour with cream of tartar. If at the end of two days the fever and tenderness does not get better pare down the soles and open them at the toe to let out any watery matter that may exist, for fear the horn may separate from the quick, keeping on the poultices afterwards as before. When the inflammation subsides blister the pasterns and apply the corrosive liniment No. 189 to the soles of the feet, and keep the horse standing on soft clay, or if in Summer time turn him into a moist, soft pasture.

As a rule, neither bleeding from the neck or active purging should be allowed in founder. There are, however, cases occasionally in simple founder, from overfeeding when tired, or giving cold water when warm, when a gallon of blood taken from the neck and an active purge of a quart of linseed oil has acted like a charm, the patient recovering almost immediately. In this the operator must be guided by circumstances. If the horse is fat and full of blood it will tend to reduce the inflammation by drawing the blood to another part of the system. If so the blood should be allowed to flow in a full stream.

VIII. Nail Pricking.

The prick of a nail in shoeing, or from having a nail enter the foot in traveling often leads to the most serious consequences if allowed to proceed, such as ulceration, ending in quittor and other disabilities. An animal being lame without swelling, inflammation or other indication of strain or bruise, the feet should be carefully examined, and the nail or other substance be cut out, at whatever pains it may take. Then dress the parts with hot pitch, cover with tow and give the animal rest for a few days.

IX. Canker.

This is one of the diseases that may arise from the prick of a nail or bruise. Again it may occur without apparent cause

How to know it.—It is a disease most prevalent in heavy, coarse-boned horses. The frog will become large, spongy, and covered with a fungous growth of a cheesy texture, and throwing out an abundant colorless, bad smelling fluid. If cut away it will again quickly spring into growth. The discharge is more offensive than in thrush, and the disease more obstinate, often resisting treatment for a long time.

What to do.—The horse must be kept in a clean, dry, well-ventilated stable. All diseased portions of the hoof must be carefully pared off so far as the knife may be able. The cure consists in destroying the fun-

goid granulations. Thus in cutting do not be alarmed at the sight of blood from the canker. Over the well portion of the hoof spread the following:

No. 194. 4 Grains chloride of zinc,
1 Ounce flour.
Mix, and apply dry.

Cover the diseased parts with the following:

No. 195. ¼ Ounce chloride of zinc,
4 Ounces flour.

Tack on the shoe lightly, pad the parts within the shoe well, and secure good pressure by cross pieces driven firmly within the shoe. The second day after remove the shoe and padding, cut away everything that appears to be in a sloughing condition; repeat the dressing every two days until the parts are sound. As soundness begins to appear in portions of the surface, dress these with the following; that is, when fungoid granulations have ceased to sprout:

No. 196. 2 Grains chloride of zinc,
1 Ounce flour.

As the canker improves, the dressings may be extended to the third or fourth day, and during the whole time of treatment the horse should be liberally fed, and be exercised gently for four hours every day.

X. Sand or Quarter Crack.

These are of two kinds, quarter crack, occurring in the inner quarter of the fore foot, and toe crack, occurring in the toe of the hind foot, both being cracks and fissures in the walls of the hoofs, beginning at the coronet and extending downwards.

Causes.—Defective quality of the hoof, causing brittleness; bad shoeing, or splitting of the hoofs from hard driving on solid roads.

How to know it.—When the horse leans his weight on the hoof, the crack will open; when the foot is lifted the crack will close. Sand and dirt work into the parts, causing excessive pain and lameness, often fever and the formation of matter.

What to do.—In recent cases, before there is much inflammation, all that will be necessary to do will be to remove the shoe, cleanse the crack thoroughly, cutting into it if there is dirt or sand lodged inside, drawing the hoof together closely again, by the means of two thin clinch horse shoe nails, one at top and one at the bottom, and filling with the following composition·

No. 197.

½ Ounce tallow,
1 Ounce oil of turpentine,
2 Ounces resin,
4 Ounces beeswax.

Melt together, and fill the crack with it quite warm, and let it cool. The foot should be protected so no dirt can enter, and the horse turned to pasture until a new hoof is grown, placing a bar shoe on the injured hoof.

If the crack is an older one, and there is inflammation, the edges must be pared and the fissure sufficiently laid bare so it may be thoroughly cleansed of all grit and dirt. The crack must then be thoroughly fomented to reduce the inflammation, and poulticed until it assumes a healthy appearance. The parts must then be brought firmly together by means of clinch nails; covered with ointment, No. 197; a bar shoe put on, and a new hoof allowed to grow.

XI. False Quarter.

This difficulty differs materially from sand crack, inasmuch as it is a deficiency in the growth of the horn of the hoof extending from the coronet to the sole. It is a gap in the wall of the hoof rather than a crack.

Causes.—It is produced from a deficient secretion of the horn making power, owing to previous quittor, frostbite or other injury to the coronet.

What to do.—The principal means to be used is careful shoeing with a bar shoe. If the injury has been recent, stimulate the coronet with a mild blister, or if there is a wound, cut the edges with a knife and dress with weak carbolic acid water, to induce a healthy growth of horn. In old cases, all that can be done is to fill the fissure with gutta percha, and protect the weak hoof with a bar shoe.

XII. Quittor.

Causes.—This fistulous condition of the fibrous cartilage of the foot—inflamed, suppurating, penetrated by canals in various directions, with openings upon the quarters and heels of the coronet—is caused by pricks in shoeing, by threads, by suppurating corns or bruises, by neglected bad tread or over-reach, by neglected thrush, by irritation from sand-crack and false-quarters, by bruised sole that sometimes takes place when flat-footed horses are ridden over stony ground; in short, by any injury which leads to inflammation of the cartilage of the hoof and the formation of pus inside. When the sensitive portion of the foot is pierced by a nail, or when inflammation has followed a bruise, suppuration speedily

follows, and the accumulating matter presses in every direction, and, finding no ready outlet, the little fleshy plates of the coffin bone are forced from the horny ones of the crust, or it may burrow between the horny and fleshy sole, and far towards the very central portion of the foot. Pipes and sinuses are then made in every direction; but the outlet is generally by abscess of the coronet, or that portion of the hairy skin running immediately down upon the hoof.

How to know it.—A recent wound or ordinary abscess of the coronet may be mistaken by the inexperienced for quittor, especially if any lameness attends it; but a little examination will readily disclose the true nature of the case. From a simple wound, there is not apt to be a fetid discharge of so unwholesome a character as that which oozes from the sinuses of the quittor, and the parts must be more or less swollen, and yielding to pressure, whereas, in quittor, the surrounding tissue is hard, though it has taken on a peculiarly unhealthy action, and probing with the flexible probe, or *bougie*, will discover the presence of a sinus or of sinuses, of more or less depth. There is almost always lameness, which is sometimes excessive, and of a halting character: the coronet is somewhat swelled into a ridge around the top of the hoof, and about the center of which one or more small orifices are found, that discharge in small quantities an offensive matter—sometimes rather thin and watery, again, thick and having a curdled appearance. The probe, as we have said, will disclose sinuses, and these generally tend downward into the foot. The quantity of matter discharged is often very small at first, so much so as to be out of all proportion to the very serious nature of the trouble, and the difficulty attending a cure. Even when the opening or openings will scarcely admit the small *bougie*, there may be much matter, and this may have penetrated under the cartilages and ligaments, and to the coffin-joint itself. Wherever it has gone, it has formed fistulous pipes, or ulcerations that are difficult to heal. There is usually increased heat, as well as much tenderness of the foot.

What to do.—The first step is to discover, if possible, the cause; and if this is still operating, to make every effort in your power to remove it. Sometimes there is such swelling around the hoof, and such excessive tenderness, that the animal cannot bear to have the foot handled except in the gentlest manner. In this case, apply a good softening and cooling poultice, and keep him as still as possible—renewing the poultice as often as it begins to grow dry and hot—until the inflammation is something reduced, and the extreme tenderness overcome. Then, remove the shoe and withdraw every nail if it can be done. If the trouble has been caused by a nail, and the nail can be removed, there is already something

of a dependent opening made by which the accumulated pus may escape, and this opening may be enlarged by farther paring away the hoof, so as to reach the softer part, that can be more readily cut with a keen knife.

A small probe, or *bougie*, should be inserted from above, and worked to the lowest depth of the sinus. If this extends far towards the base of the foot, the prime object should be to get an opening from below to meet it, no matter what may have been the cause—whether a prick, a bruise, or irritation caused by other foot diseases. This dependent opening established and kept open, the pus will in time be evacuated, and the foot will return to its healthy state, unless the joints have been attacked, in which case a cure is scarcely to be hoped for.

If the disease is of long standing, the internal surface of the sinus or sinuses has become more or less callous, and a stimulating lotion must be injected with a syringe every day, composed of one drachm chloride of zinc to one pint of water—increasing the chloride gradually to two drachms.

This treatment will suffice. The main trouble, however, is to make the dependent outlet. In case this cannot be done, owing to the shallowness of the sinuses from above, reduce the inflammation by poulticing, as previously directed, and then inject this somewhat caustic solution into each channel or pipe:

No. 198. 5 Grains bichloride of mercury,
1 Ounce spirits of wine,
20 Drops muriatic acid.

Do this three times the first day, twice the second day, and once a day subsequently. When the discharge has ceased, stop the injection, and simply keep clean by the use of warm soap suds, used as necessary

If it is found impracticable to inject this solution into the openings, adopt this instead: Insert, by means of a wet probe, a mixture of corrosive sublimate and flour (three parts of flour to one of corrosive sublimate). Persevere until you know that every part of the sinuses has felt the caustic. In two or three days thereafter they will begin to discharge a white, curd-like matter. It may be necessary to repeat this, but if thoroughly done, and there is no affection of the joints, a cure may be expected.

Sometimes the trouble rises from a gravel having insinuated itself between the shoe and the sole, and creating a bruise or corn. This may be ascertained by removing the shoe and seeking for a spot unnatural in appearance, hot, and tender on the sole. If found, it ought to be pared down so as to reach the more sensitive part of the foot, and, if possible, to discover and liberate matter.

In making examinations preliminary to treatment, the greatest care should always be exercised, as the treatment, to be successful, must be specially adapted to the exigencies of the case. It sometimes happens that the trouble is critical, and that only an experienced practitioner ought to be intrusted with it. When the probe indicates that the direction of the sinuses is backward, the chances are in favor of recovery; but if it shows the direction to be forward, the important and complicated parts of the foot are in danger, and the result of even the best treatment is doubtful.

In any event, a complete cure requires much time, and a more than ordinary exercise of patience and care.

If the patient, in moving about, strikes the swollen parts above the fore-foot with the toe of the hind-foot, or if he hurts it in lying down, some steps ought to be taken to obviate these additional causes of irritation and pain.

If the general health of the animal is scrupuously attended to, it will materially assist in the management of the local disorder.

XIII. Toe Crack.

A hoof with crack in the toe should be treated precisely as though the difficulty occurred in another portion of the wall of the hoof. The difficulty in all cracks of the hoof, is the difficulty in healing, for the reason that when the animal steps, especially on uneven ground, the walls are strained apart. In sand-cracks, the principal care must be to extirpate the grit and dirt, whatever the amount of paring and cutting it may take. If granulations appear, they must be cut out. Then wash with a solution of chloride of zinc, made as follows:

No. 199. 1 Grain chloride of zinc,
1 Ounce of water.

Whatever the quantity made, let it be in this proportion. Cleanse the whole interior of the crack fully. In cutting away the hoof, it should present an oval shape when finished, the points at top and bottom.

Having cleansed the inner portions, if the crack does not extend completely from the coronet to the toe, with a firing iron, just hot enough to cause the horn to smoke, the iron not at a red, but at a black heat, soften the crust and continue the cutting until the diseased portion is all exposed. If granulations (proud flesh) show, cut it out and let the parts bleed. Then continue the application of the chloride of zinc lotion three times a day until a healthy reaction is produced. The crack may then be stopped with pitch or tar and tow, or gutta percha; a bar shoe put

on with two clips in front to hold the parts together, and the animal kept in a clean, soft pasture until a new hoof is grown. An examination of the parts being made from time to time to see that no grit or foreign substance has entered to increase the difficulty.

Sand-cracks, quarter-cracks, and false-quarters, will require time to ensure full recovery, and the time so consumed should not be grudged.

XIV. Pumice Foot.

Pumice foot, the effect of chronic laminitis, is an excessive growth of soft, spongy horn in place of the healthy hoof, forming rings running together at the toe, causing a bulging at that point and a depression above. This growth in front of the laminæ of the toe separates the coffin bone from the wall of the hoof, and allows the bone to press upon the sole and even to pierce through it. Thus the sole becomes convex instead of concave, the animal becoming groggy, and in time quite crippled. This state is almost entirely confined to animals with flat feet and weak limbs, weak and brittle crusts to the feet, with large, prominent frogs.

What to do.—In bad cases there can be no cure. Much may be done to alleviate distress, and enable the horse to do slow work, especially on the farm. Put on a thick, broad webbed bar shoe, a dished shoe having the web hollowed out, or beveled toward the inner side on the upper surface and thinned down from the toe to the heel. It is better that the shoe be also assisted with a bearing of leather next the sole.

The hoof should be smeared daily with equal parts of glycerine and tar. If heated in slightly so much the better. The sole should also have the same application. Apply a mild blister to the coronet from time to time to stimulate action, and turn the horse into a soft, damp pasture. Thus in time a fairly smooth hoof may be grown, but it can never be expected to be entirely sound.

XV. Seedy Toe.

The wall of the foot is composed of two layers, the outer one darker, harder and thinner than the inside one; the inner layer thicker, softer and lighter in color than the outer. The outside layer is secreted by the coronet, the inner one from the sensitive laminæ. In health these are intimately united, forming the thick, tough, elastic hoof, capable of bearing the shocks of the body in traveling.

Causes.—If from any cause, inherent weakness, undue shocks, disintegrating the laminæ, or other cause, the separation begins at the toe, just as in the human nail the separation begins at the margin—it produces seedy toe.

How to know it.—If a seedy toe be struck with a hammer it will give a hollow sound, showing that it is disunited. Remove the shoe and a separation will be found between the two coats of the hoof.

What to do.—Find the extent of the separation with a thin probe. Cut away such portions of the crust as may be disunited, and to where there is firm adhesion of the parts. If there is a powdery substance clean it out. Keep the cavity filled with warm tar, properly held in place, and shoe so as to give a uniform bearing, and support the weak part with a clip if necessary. This dressing must be repeated from time to time as required, until the cavity is entirely filled with a new and healthy growth.

XVI. Ossified Cartilages.

Ossification of the cartilages is sometimes called false ring-bone. It is a disease to which many horses are sometimes subject, and often exists in connection with ring-bone and side-bones.

Causes.—Jarring, by hard driving over rough roads, or pounding on hard pavements, or any of the causes producing ring-bone or inflammation of the parts.

How to know it.—When the difficulty is new, there may be fever in the parts. Later there will be more or less enlargement of the back of the coronet and the heel, the parts feeling hard, irregular or lumpy. The horse is not always lame, but if driven over hard roads, the horse will show soreness and travel short after cooling off.

What to do.—In old standing cases, but little can be done; rubbing the parts with oleate of mercury will reduce so much as is not already bony substance. In connection with this put in a seton under the affected part. In more recent cases, if there is heat, bleeding from the foot will give relief. Then apply cloths dipped in cold water to every quart of which has been added a half pint of tincture of arnica. The inflammation being reduced, apply repeated dressings of biniodide of mercury. This will promote absorption, but a complete cure may not be expected.

XVII. Side Bones.

Side-bones are ossifications from the heels of the coffin-bone into the lateral cartilages. In heavy horses, side-bones may occur in connection with ring-bones. In fact, ring-bone has its seat in the *os suffraginis*, and side-bone in the parts about; the first being in the pastern; the latter lower, or about the coffin-bone.

How to know it.—The enlargement is just above the coronet and immediately below, when ring-bone exists. Side-bone may be found at the back and lateral parts of the coronet. There will be more or less soreness and lameness, but after ossification bony formation of the parts has been completed, the joint is either stiff or nearly so.

What to do.—The treatment should be precisely identical with that prescribed for ring-bone.

XVIII. Incised and Punctured Wounds of the Sole.

Incised wounds are those made with a sharp instrument; punctured ones are those made with a blunt one, as a nail. If the cut be a clean one, all that will be necessary to do will be to pare away the sides to be sure that no foreign substance is lodged there; wash out with tincture of aloes and myrrh, and keep the wound closed with tar and tow, and give rest until healed.

If the difficulty be from a nail, care must be taken that it is all extracted. This must be done at whatever cost of cutting. Then dress as prescribed for the incised wound. In old cases, where suppuration has taken place, the matter must be let out by enlarging the orifice. Then the same means for cure may be adopted as in quittor or other maturated sores.

CHAPTER XV.

WOUNDS AND INJURIES AND THEIR RESULTS.

I. STRAINS AND SPRAINS.—— II. OVER-REACH. —— III. BRUSHING, OR SPEEDY CUT.——IV. BROKEN KNEES.——V. CAPPED ELBOW.——VI. FROST BITE.——VII. BURNS AND SCALDS. —— VIII. RUPTURE. —— IX. CHOKING. —— X. WOUNDS PENETRATING THE ABDOMINAL CAVITY.——XI. CONTUSED WOUNDS.——XII. LACERATED WOUNDS. ——XIII. PUNCTURED WOUNDS.——XIV. BROKEN HOCK.——XV. DISLOCATIONS. —— XVI. VARIOUS FRACTURES. XVII. VARIOUS DISTORTIONS.——XVIII. DISEASES OF THE EAR.

I. Strains and Sprains.

In the human subject, a strain is simply a wrench, by which a fiber, a ligament or tendon is stretched beyond its proper capacity, and followed by pain, lameness, and inflammation of the parts.

A sprain is an incomplete luxation (dislocation) in connection with stretching, with more or less laceration of the ligaments of a joint, and even rupture of the tendon. In veterinary practice the word strain is used. It is far more difficult to handle than in man, and for the reason that it is often difficult to prevent an animal from using the parts.

Replacement of the parts as near as may be, and rest, are the surest means of cure. Therefore in every case the intelligent horseman will use the best means to ensure this; consequently it will be simply necessary to lay down certain rules of guidance to be followed.

Strain of a joint.——In a joint that is easily flexed, (moved back and forth) the parts should be held firmly by means of a starch bandage, if there has been sufficient stretching to produce loss of continuity.

How to make a starch bandage.—Provide a long strip of strong unbleached muslin, and of a width proportioned to the part injured. Soak this in strong starch, and bind on while wet, making a half turn of the cloth in passing about the limb, so it will form a figure eight. Allow

this to dry without movement and it will hold the parts firm. If the strain occurs in the fetlock, hock, or knee, this will be indicated. For a lighter strain, a simple cold water bandage will suffice.

In all strains, rest must be given, the diet should be light but wholesome, and if the bowels become costive, they must be stimulated to action by alterative medicines. Strains of the ligaments or muscles must be met with cold water bandages. In all strains, however, dependence in the early stage must be upon arnica, equal parts of the tincture and rain water. Bathe the parts thoroughly and carefully two or three times a day, and then apply the cold water bandage, keeping it wet.

If the strain is in the shoulder or loin, lay a wet blanket over the part affected, and cover with a dry one, changing as often as may be necessary. Sponge the affected parts with the diluted tincture of arnica, as before recommended.

This, with rest, a light diet, keeping the bowels regular, and an ounce of cream of tartar to the bucket of water, ought to subdue any curable case of strain.

II. Over-reach.

Causes.—A tired horse, especially when going at a fast pace, sometimes fails to lift the fore feet quick enough. The result is the inner part of the hind foot strikes the outer side of the coronet of the fore foot, or higher, often producing a severely lacerated or contused wound.

What to do.—The only remedy is to clip the torn portions away, and keep the parts washed with chloride of zinc, (No. 195), first cleansing the parts with water if at all dirty. The healing must take place through the sloughing of the torn parts, and by granulation. If slight, tincture of arnica will be sufficient as a lotion. Treads from calking may receive the same general treatment.

III. Brushing, or Speedy Cut.

This is a bruise, abrasion of the skin, or contused wound, produced by the shoe of one foot striking the opposite fetlock ankle, or even the knee. It is more owing to weakness than other causes, though a horse striking once is more liable to the same injury thereafter. It is really the foot that is resting on the ground that causes the hurt, from its being put down out of the proper line.

What to do.—For horses of slow or moderate driving, the difficulty is confined to striking the ankle and below. The usual remedy is to cause the horse to set his foot in proper line by raising that side of the shoe, thus throwing the inside of the ankle slightly up. Any common sense

blacksmith should know how to do it. For fast horses, the limbs must be further protected by means of pads and other appliances to be found at all saddlery establishments.

IV. Broken Knees.

This is a common disability of stumbling horses, and of saddle horses kept for riding, leaping, or hunting. A horse with the scars of broken knees should never be used as a saddle horse, unless it can be clearly shown that the hurt was done accidentally in leaping upon a foul landing place.

What to do.—The first thing to do is to find the extent of the injury. It may be that it is only a slight bruise with or without abrasion of the skin. In this case, using the tincture of arnica two or three times a day, and a cold water bandage, if there is heat, should ensure recovery.

Sometimes, however, there is an ugly, lacerated wound filled with dirt and gravel. In this case the parts must be well washed by repeatedly filling a large sponge with clean, warm water, and squeezing it dry against the limb above the hurt. Never, under any circumstances, put it against the hurt. It only soils the sponge and presses the particles of dirt farther into the wound. If there is a sac below the cut containing dirt it must be carefully probed, and opened from the bottom with a keen, sharp pointed knife. The object is that no grit may remain in the wound to prevent its healing. A seton should be tied so the sac may be emptied of its contents in the process of suppuration. If the granulations become soft and flabby, showing proud flesh, they must be touched with nitrate of silver. In three days after the establishment of suppuration the seton may be withdrawn. The wounded parts must be kept wet with cold arnica water, the proper proportions being one ounce tincture of arnica to each pint of water used.

Copious suppuration having been fairly established, discontinue the use of the arnica, and use instead the lotion made by dissolving in each ounce of water used a grain of chloride of zinc. Use no bandages. Cleanliness of the parts is necessary. These means should carry the knee to a favorable issue.

Sometimes, however, the injury is so severe that the ligaments and even the joint is injured. It then becomes a most serious case. In this event the animal must be put into slings, the joint brought together, after being thoroughly cleansed as before stated, the parts must be bandaged and astringent washes used to promote the uniting of the parts, while the same general treatment is pursued with the laceration as advised before. In case the injury be so severe as to involve the joint, if a veterinary

surgeon cannot be had with proper appliances for caring for the horse he had better be killed at once.

Besides injury to the knee by falling, it is sometimes injured by having some sharp substance driven forcibly into the ligaments or even between the joints. These should be carefully looked for and removed, since old running sores, fistulas and other disabilities may result, completely destroying the usefulness of the animal. Joints other than the knee may be similarly injured. If so, the general treatment should be the same. First reduce the inflammation, and then use means for cure. In ordinary cases, as a healing agent, in wounds, either lacerated or contused, we have never found anything better for promoting healthy granulation or healing of the parts than a free use of tincture of aloes and myrrh.

V Capped Elbow.

Causes.—This tumor at the back point of the elbow is generally caused by a bruise inflicted by the calkings of the shoe while the horse has slept with his legs doubled up under him. Inflammation of the sub-cellular tissue is established, and that condition sets in which gives rise to enlargements by increased deposit near the part. The tumor is circumscribed, being confined to the elbow, but it sometimes grows to an enormous size, and hangs loosely from the back point of the elbow, and interferes with its action.

It may be produced also by long heels, as well as calkins, by striking with the shod hind foot, by a blow, and by lying on uneven surfaces.

How to know it.—A slight swelling of the point of the elbow is first perceived, and unless the cause is removed this will gradually develop into a large-sized tumor. When of any considerable size, it will contain serum, or a watery matter, and has a fluctuating feeling to the fingers. This fluid is contained in tough, fibrous walls, and may remain for a long time, or it may at last be absorbed, and leave a hard tumor. At this stage there will of course be no fluctuation.

What to do.—If discovered in its early stage, and serum is evidently present, let it out by opening the sac at the lower edge with a keen knife, or a thumb lancet. Press upon it so as thoroughly to remove the fluid. Then, with a small rubber syringe, inject a mixture of equal parts of pyroligneous acid and water. Next, moisten it externally, morning and night, with the camphorated corrosive sublimate, No. 2, which will have the better effect if dried in at once with a hot iron held near. Before the horse is allowed to lie down again, make a soft pad, covered with chamois skin, without a seam on the outer side, of such thickness as to keep the shoe from striking the elbow when the leg is doubled under him,

and tie it securely round the pastern. This should be on every night; and even after cure is effected it will be necessary for the animal to wear this pad, to prevent recurrence of the bruise, or else to have the shoe shortened. The pad must be at least two and a half inches thick.

If it is in its new state (a simple swelling without matter), it can be assuaged by using frequently, at moderate intervals, some cooling lotion.

If large, watery, somewhat pendant, and unsightly, have an experienced surgeon remove it entirely; and then dress as an ordinary wound.

If, after it has been opened, and the fluid pressed out, it heals with hard substance left behind, rub frequently with acetate of mercury until the natural state is restored.

If treatment is undertaken only when there is no watery matter, no fluctuation, remove it absolutely by making a vertical slit, of sufficient length, and dissect the lump; after which treat the wound with simple cerate, or any healing ointment.

Care must always be taken to guard against having the elbow injured again while treatment is going on, and to prevent rebruising the part after cure is effected.

If there is constipation or otherwise feverish tendency in the animal, the cure of tumors or other local troubles will always be more difficult unless this tendency is removed by suitable purgatives and carefully regulated diet.

VI. Frost Bite.

Injury from the effects of frost is more common in the North and West than is generally supposed, and in many cases rheumatism, founder and other "stiff complaints" may undoubtedly be attributed to this as the predisposing cause.

Causes.—Long exposure to cold, either standing in the open air or confined in cold stables; standing in half melted snow and slush; keeping young animals in exposed yards, where they cannot take exercise and with insufficient food.

How to know it.—The skin of the injured parts in light cases, turns purple, inflames, cracks and exudes a bloody serum; or if severe, the skin and tissues beneath lose color, and become dead and eventually shrivel. The skin, particularly of the heel, will crack, often from one side to the other, refusing to heal.

What to do.—If the limbs are simply chilled, friction will be all that is necessary. If actually frozen, the animal should be warmly clothed and the frozen parts be rubbed with snow until circulation is partly restored. Then put the parts in cold water and continue rubbing until

warmth and circulation are entirely restored. Then dry thoroughly with cloths and hard rubbing.

If the frosting has been neglected and raw sores make their appearance, prepare the following:

No. 200. 2 Drachms belladonna,
1 Ounce petroleum,
1 Ounce lard.

Rub the whole thoroughly together, and apply twice a day to the raw or ulcerated places. If this does not promote recovery, and decided ulcers occur, add to the above prescription 2 ounces red oxide of mercury. Rub all well together and apply once a day to the ulcerous parts.

VII. Burns and Scalds.

Burns and scalds seldom occur in horses kept on the farm or employed on the road. They are, however, of frequent occurrence when horses are employed about mills or factories where steam is used; or in iron founderies and in cities.

What to do.—One of the best and most easily obtained applications, for a fresh burn or scald, is to dredge bicarbonate of soda, common baking soda, thickly on the part, or moisten with water into a thick paste and bind it or lay it over the injury. For slight burns, which sometimes cover a large surface, there is nothing better than several coats of thick white lead paint laid on with a brush; cover the whole with cotton and bind on close,

Strong alum water is also an excellent remedy for fresh burns and scalds, the proportions being 2 ounces of powdered alum to each pint of rain-water. Keep the parts well soaked with it, and wet cloths saturated with the same constantly over the surface.

Sometimes indolent sores follow burns and scalds. If so, the ulcers should be well and carefully washed with tar water, and the following mixture dusted over the parts:

No. 201. 1 Ounce oxide of zinc,
2 Ounces powdered starch.

Mix intimately and dredge on thickly to form a crust. Wherever the moisture appears through, keep adding the mixture until the crust becomes permanent and fixed.

VIII. Rupture.

Rupture or burst (Hernia) is the displacement of an internal organ

through an opening, either natural or otherwise. The rupture most commonly seen is of the bowels and omentum. The omentum is the membranous covering of the bowels or the caul. The bowels may pass through the caul by rupture, or the bowels and involved caul may, it is possible, pass through the mesentary, the membrane retaining the intestines in their proper position.

If the rupture is into the chest, it is called diaphramatic, and may occur from a violent shock, as in leaping, or in 'bucking,' as jumping stiff-legged is called. In bad cases death is sudden from suffocation. In the slight forms there may only be difficulty of breathing, with lifting of the flanks, as observed in heaves. The only remedial means to be used are to give anodynes and rest. Thus slight cases may at length take on the chronic form, but will never be cured.

Hernia of the mesentary and omentum is difficult to know, and no remedy can avail, except rest, with anodynes if there is pain.

Naval rupture, and that through the scrotum, is most common. The only means of cure in naval rupture is where pressure can be had by means of a bandage or truss and taken in the earlier stages. The intestine must first be carefully pressed back and pressure made over the parts by means of a soft pad, securely fastened, and to be worn until the orifice is closed or at least permanently contracted. Of course an animal with rupture of any part is not capable of violent exertion.

Rupture of the scrotum is also common in males. In cases of colic in entire animals, an examination should be made for scrotal rupture, since there may be colickey symptoms. There may be a swelling of the bag containing the testicle, the contents being movable, and disappearing upon pressure. In the smaller animals, castration may be employed, the gut returned and the wound sewed up.

Ventral hernia is known by the contents being movable and gurgling, and easily pressed back to their place. If recent, the animal should be thrown on its back, using ether or chloral to keep quiet, returning the protrusion, padding the orifice, and covering with strong factory muslin wound round the abdomen and laced along the back, the bandage being kept in place by bands fastened in front and carried to a collar worn on the neck. Except in the case of valuable animals, treatment scarcely pays, unless a veterinarian can be employed who understands anatomy.

IX. Choking.

Choking occurs in two distinct forms. The high choke, when the substance is lodged in the throat or neck; and the low choke, when the substance is lodged in that part of the gullet lying low down within the

chest. In high choke, the animal may die in a few minutes; in low choke, there is not such special need of haste.

How to know it.—There is intense distress; the head is raised; there is slavering, violent coughing and continual efforts to swallow.

What to do.—Examine carefully the furrow on the left side of the neck for the substance. If solid, endeavor to press it upwards with the fingers on each side. If not, endeavor to extract it by putting a balling iron into the mouth to hold it open; pull out the tongue; pass the hand into the throat and endeavor to dislodge it with the finger, the head being held out in a straight line with the neck. If this do not succeed, and the obstruction is in the gullet and is clear of the windpipe, procure a probang, oil it thoroughly, cast the horse, put the balling iron in the mouth, introduce the probang and by steady pressure for a few seconds at a time, endeavor to move it. If it moves continue the pressure until it is pushed into the stomach.

If the substance is so firmly held that the probang will not move it, the mass must be cut down upon and taken out. Let an assistant press the off side of the neck to get as much bulge as possible. Then with a bold cut of a sharp knife, cut through skin, tissues and gullet, to the mass, with an ample cut, and remove; bring the edges of the gullet together, stitch them with fine catgut, or strong silk, and then the wound in the skin. The difficulty here may cause subsequent stricture of the gullet, which may thereafter prevent the animal swallowing solid food. In any event only semi-liquid food should be given for ten days after choking, or until the animal seems well.

In desperate cases, where there is instant danger of death from choking, tracheotomy must be employed. This is cutting into the windpipe and inserting a breathing tube and will be treated in its appropriate place.

THE LOW CHOKE.—This is where the obstruction is low in the gullet, or in the thoracic portion of the æsophagus.

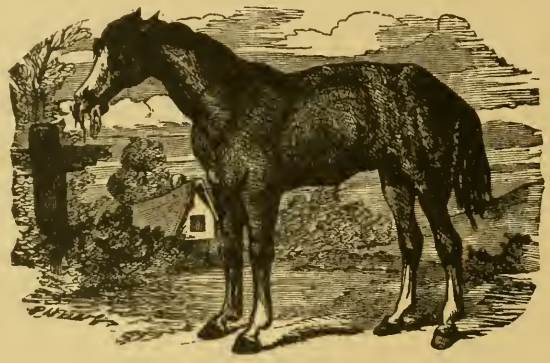
In this form there is great distress but the head is not held so high; saliva runs from the mouth, and the discharge is copious from the nose; if the animal attempts to drink, the water is cast forth from the nose; the breathing is laborious, the flanks tucked up, the back roached, and the animal shows symptoms of general distress.

What to do.—Give a gill of linseed oil or lard oil once an hour, and between these doses every hour the following anti-spasmodic:

No. 202. 2 Ounces sulphuric ether,
2 Ounces laudanum,
½ Pint water.

Use the probang carefully after each anti-spasmodic. If the whole of

the dose is apparently returned, administer chloroform from a sponge, by inhalation, until entire insensibility is produced. Then extend the head, insert the probang, well oiled, and use steady but constant pressure, until the substance moves. It may take ten to fifteen minutes, or more. When the substance moves do not use much violent pressure, but move it carefully until it enters the stomach, care being taken not to force the instrument too far and thus wound that organ, remembering always that sudden violence may bring on spasmodic action, in which case efforts must cease. Violence may also rupture the æsophagus.



THE LOW CHOKE

X. Wounds Penetrating the Abdominal Cavity.

A penetrating wound of the walls of the abdomen is generally followed by protrusion of the bowels. Sometimes it is so extensive as to allow a large portion of the intestines to escape. If so, they should be supported by a sheet fastened over the back to prevent injury by the feet and the admission of dirt until relief is given.

What to do.—The horse should be cast, the bowels washed with tepid water, the horse turned partly on his back, the intestines properly returned to their place by pressure, and the wound sewed up with catgut, well soaked in warm oil, and at intervals of an inch apart, bringing the edges nicely together. Then encircle the belly with a strong bandage properly fastened, by being laced along the back. Empty the rectum, if necessary, by means of injections of warm water or soap suds, and keep the bowels open by feeding scalded shorts pretty well salted.

XI. Contused Wounds.

A contused wound is one occasioned by injury from some blunt instru

ment, as a hook, wagon shaft, or other similar medium. They often leave a gaping wound with torn and bruised edges.

What to do.—Clip away all torn and bruised flesh that present ragged edges. If the injury is not extensive all that will be necessary will be to keep the bowels of the animal in health, and moderately loose, with bran mashes, using the following lotion daily. This is known as the compound tincture of aloes and myrrh and should be kept in every stable as a dressing for wounds, galls and other injuries of that nature. It is made as follows:

No. 203.
4 Ounces myrrh,
4 Ounces benzoin,
4 Ounces of catechu,
8 Ounces pulverized aloes,
1 Gallon Jamaica rum.

Mix, keep in a warm place for two weeks, frequently shaking it, and filter through linen. If the wound assumes an unhealthy character, wash with water in which a little carbolic acid is mixed. When granulations appear, if pus, matter, forms, wash daily with a syringe and warm water, and use the carbolic acid wash for dressing, or, if the wound is in such a place that it may be done, cover with tow saturated with the wash. If the granulations are soft, flabby and projecting, showing proud flesh, touch them with a stick of lunar caustic, and expose to the air until dry. Then dress as before directed.

XII. Lacerated Wounds.

A lacerated wound is a torn wound. The wound by treading, calking, is a lacerated wound. The tearing up of the skin and sub-cellular tissues, leaving a flap, is a lacerated wound.

What to do.—In any wound, if feverish symptoms occur, give an ounce of pulverized saltpeter in the drink night and morning, and administer a moderate purge, unless the bowels are open, say 4 ounces of aloes.

In the case of any lacerated wound, if extensive, clip away all torn shreds, bring the edges nicely together and sew them with fine catgut, or white waxed silk, and let the subsequent treatment be as directed for other wounds.

XIII. Punctured Wound.

A nail, the point of a fork, a splinter of wood, a thorn, or any similar substance, makes a punctured wound. They are the most dangerous of wounds, from danger of internal poisoning, or fistula, lockjaw, etc.

What to do.—First, examine carefully by means of a probe for any foreign substance lodged inside. If so, remove it, even if a clean cut has to be made. A clean cut is not dangerous unless an artery is severed. If the instrument inflicting the wound was dirty or rusty, syringe the wound thoroughly with weak carbolic water. If the wound heals kindly, use the tincture of myrrh dressing, No. 203. If inflammation sets in, and matter forms in a deep, narrow wound, it may be necessary to enlarge the opening to let out the pus. Then treat as directed for contused or lacerated wounds.

XIV. Broken Hock.

MANNER OF USING SETON NEEDLE.

This is a term applied to a severe injury—breaking the cap of the hock. The only treatment is absolute rest, the application of sedatives as lotions, laudanum equal parts with water, to remove pain, and astringents—white oak bark. It is sometimes necessary to blister near the part to get up counter irritation, or put in a seton below the hurt. The mode of using a fixed seton needle, to bring a wound together, in sewing, where a proper crooked, flat needle is not at hand, is here shown. It will also serve to show the manner of using a needle for a seton, to be threaded with white tape.

XV. Dislocations.

Dislocations in the horse are rare, and when they occur are difficult to manage, except with the aid of a veterinary surgeon. Dislocation of the lower joints, and of the hip, is most common, from catching the foot, twisting and pulling thereon to get free. In fact, dislocation of the hip is scarcely ever seen except in connection with fracture, but is sometimes met with in lean, under-fed, young cattle and horses. Dislocation of the shoulder is most seldom met with.

What to do.—In any case of dislocation the first thing to do is to put the joint in place, not always an easy matter. The means we have indicated for dislocation of the stifle will serve to show the manner of operation. A veterinary surgeon should be employed if possible in any case of dislocation. If such cannot be had, any humane surgeon should be willing to give advice as to how to operate. The means to be employed are so different, varying with each particular case, that it would be impossible to state them except in a general way.

If inflammation and considerable swelling has set in before the hurt is discovered this must be first reduced by cold water applications, or better, hot water fomentations, if persistently applied. Then the joint must be brought to place by traction and force. If there is no inflammation this will not be difficult.

When a starch bandage may be employed, this should always be used to hold the parts together. If not the dislocation must be splintered or padded, or both, to keep the parts intact and in place. The slings should always be employed to rest the horse when they may be had. This with cooling lotions to subdue inflammation, rest, proper care and feeding, will ensure recovery in the end. A bad dislocation, however, usually leaves the horse out of condition for anything but farm or slow work.

XVI. Various Fractures.

To fracture a limb completely, so the leg hangs loose, is of so serious a nature, in the horse, that unless in the case of a very valuable animal for breeding purposes it had better be killed at once. In very many cases, however, one of the bones of the leg is fractured or split part way, though the horse may not exhibit extreme pain, may even travel upon it. Softening, however, sets in, and sometime after, in getting up in the stable, the bone gives way entirely. So the fibula, as the smaller bone of the leg is called, may be fractured. If there is lameness after falling in harness, or from a blow, with tenderness, it is safe to treat for fracture.

What to do.—Place the horse in the slings and splinter the limb, first having applied a starch bandage, when it may be made to act. All that will be necessary further will be to feed and water regularly, keep the bowels naturally open, reduce inflammation and soreness by the use of arnica, and trust to time for a cure. A month or six weeks ought to so strengthen the bone that the animal can eat grass, or be fed in a box stall until recovery is perfected.

XVII. Various Distortions.

A distortion arising from fracture or from any chronic difficulty cannot be cured. In case of severe recent strain of the ligaments of the neck, by which the head is thrown to one side, and held so, the neck should be brought straight, splintered, and held so until the ligaments recover their normal tone. Poll evil often leaves the animal with a stiff neck, producing a distorted manner of holding the head. Distortions are often produced by injuries of various kinds. These must be attended to during the cure of the superinducing cause. Distortions often occur in young animals, as knuckling, turning the fetlocks from weakness, etc. The

remedy is starch bandages and splints. Distortions of the tail by which it is curved awry, are remedied by wholly or partially severing the tendons which are constricted or drawn. This, however, should never be attempted by one who does not understand the anatomy of the parts, else mischief may be done. As a rule, however, any distortion, except it be old and chronic, may be cured by taking proper measures, splintering, bandaging, and the use of fomentations where relaxation is necessary. These means the intelligence of the operator will readily suggest.

XVIII. Diseases of the Ear.

Causes.—Injuries to the ear are generally caused by brutal treatment. Twitching them, nipping and pulling upon them with the blacksmith's plyers, and blows upon the head with cudgels, sometimes result in troublesome bruises, ulcers and tumors that close the auditory passage.

Deafness may be an organic defect, or it may be the effect of some disease which has disordered the head, and, by sympathy, the auditory nerve; and the sense of hearing is no doubt dulled by old age, even when the horse may have been well used and reasonably free from disease; but it results in most cases from pulling the ears, cutting or clipping either them or the surrounding skin to remedy supposed defects, and from beating upon the head.

Sometimes scabby or mangy eruptions make their appearance upon the tips of the ears and spread downward, covering them entirely; but this is most probably the accompaniment of some general skin disease.

How to know it.—The cuts, breaks in the skin, or sutures, that result from pulling, pinching, and twitching are readily discernible, as are also the ulcers or suppurating sores in which they sometimes end. When the tendons which sustain the ear in its upright position are broken, there is no difficulty in perceiving it, as the ear drops down and flaps about with the motions of the head and neck.

Running sores, similar to the poll-evil, sometimes result; but these may be distinguished from that disease by their being confined more closely to the ear, either inside or out.

When deafness is suspected, an examination of the internal ear will be necessary; and if the swollen parts or ulcers are not perceptible, some artifice must be resorted to to find whether the hearing is actually destroyed. Deafness may be only temporary, as is sometimes the case with man, and the matter can be decided only by making a series of examinations.

What to do.—A simple laceration of the skin, and even of the cartilage, if small, will require no special attention; but if it is so great that the

edges do not come in contact, they must be brought together and sewed, after which the trouble will soon be over.

But it occasionally happens that ulceration of the skin and cellular tissue and a rotting away of the cartilage sets in. This is past all remedy, and necessitates the cutting away of the ear.

When there has been no laceration of the skin, and a tumor is forming, apply camphorated corrosive sublimate, No. 2, occasionally, till it entirely subsides; but if matter seems already forming, apply May-apple liniment, made by taking one gallon of May-apple roots and boiling them until a thick syrup is formed; then, having removed the roots, adding as much lard as there is syrup, and stirring well together while the syrup is still boiling. This liniment will draw out the fever and bring the matter speedily to the surface.

Sometimes an abscess forms on the outside, which will need lancing in order to afford the most speedy relief. In this case, cut at the lower extremity of the rising, and let the lancet slant upward into it.

Deafness, unless simply a temporary result of some prevailing disorder of the head or neck, is beyond the art of the veterinary practitioner.

CHAPTER XVI.

POISONING.

I. INTERNAL POISON.——II. POISONING FROM STINGS.——III. POISONED SKIN.

I. Internal Poisoning.

The cases of internal poisoning are more frequent, especially with horses, than is generally supposed. Among the most common are those arising from drastic or powerful doses, blindly given by the ignorant, either in disease, or from some effect sought to be produced upon the general health—to make the coat blooming, cause champing of the bit and frothing at the mouth, or to excite the animal spirits. Of these, strong purgatives, diuretics and arsenic are the most common.

A HORSE SUFFERING FROM DRASTIC POISON.

Other causes are from eating poisonous plants, either in the hay or in the pasture, the ergot of rye and other grain; ergot sometimes attacks the

grasses—thus,smutty grain, castor beans, hellebore or poke root, laurel, stramonium or Jamestown weed, and cured tobacco, among plants, may be mentioned as common. Among minerals, sulphuric, nitric and muriatic acid, and all the concentrated vegetable acids are caustic and irritant poisons. They are never taken unless forced down. The antidote to these is large doses of powdered chalk, whiting or lime water. In the absence of these give weak lye (white lye) until relief is obtained and follow with a full dose of linseed oil.

Alkalies destroy the tissues. If quick lime, caustic potash, strong lye or washing soda has been taken give vinegar and water to neutralize it, and follow with a dose of oil.

Horses that are dosed with whisky to "give them strength" sometimes show alcoholic poisoning. Never give it except as a stimulant as advised for disease.

Forty grains of arsenic will kill a horse. The symptoms are, intense thirst, quick, feeble pulse, great pain in the bowels, with purging sometimes, irregular breathing, faintness, paralysis, convulsions and death. Give full doses of oil, in which is mixed two, three or four spoonfuls of carbonate of iron as the case may seem to demand.

Corrosive sublimate is a fatal poison. A quarter of an ounce will kill a horse. The symptoms are violent pain, intense thirst, effusion, and bloody discharges from the bowels, trembling, salivation, ending in stupor and death. Give the whites of a dozen eggs, stirred in a little warm water. Follow this with linseed tea, or better with mucilage of slippery elm. Litharge and sugar of lead are poisonous. The symptoms are staring coat, arched back, a protruding tongue and foaming at the mouth, staggering, and sometimes dashing wildly to and fro. Give large doses of purgatives to be followed by from one to two ounces of iodide of potash daily for seven or eight days.

Strychnine is a quick and potent poison. Eight to ten grains will always kill. The symptoms are violent trembling succeeded by stiffness and jerking of the limbs, spasms, rigid limbs, arched back, difficult respiration, succeeded by intervals of quiet; but which are again brought on by a slight noise or even a touch. Soon the animal dies. Keep the animal quiet and in a dark place, and give a quart of sweet oil or linseed oil. Follow with powdered charcoal mixed with thin mucilage. Move the bowels by means of injections as quickly as possible, and if exhaustion ensues give stimulants (whisky) freely.

Tartar emetic in doses of two to four ounces will sometimes kill a horse. The symptoms are, thirst, vomiting and purging, staggering, colic, salivation, convulsions and paralysis.

Give strong tea, followed as soon as you can get it, with a decoction

of white oak bark. For the vomiting and purging, if they continue, give ounce doses of laudanum in a little water.

Poisoning from aloes, castor oil or croton beans, known by excessive bloody purging, and straining, cold ears and legs, hot, dry mouth, and bloating. Give two ounces of laudanum in a quart of linseed tea, and if necessary give a like dose by injection.

In poisoning from ergot or other diseased and injured foods, give full doses of linseed oil, both by the mouth and as injections, with stimulants afterwards; and tonics, say eight grains of quinine three times a day during recovery.

For poisoning by white hellebore or Indian poke, give whisky in pint doses. The same means may be used in poisoning by laurel, followed by injections of salt and water, and also by linseed oil given as a purge. In case of poisoning by opium or laudanum, pour cold water on the head from a considerable height, and keep the animal in constant motion. For poisoning with Jamestown weed (jimson) known by faintness, giddiness, followed by convulsions, paralysis and stupor, give a quart of linseed oil with two ounces of laudanum. Give also an injection and subsequently stimulate with pint doses of whisky.

Tobacco poisoning is shown by purging, offensive dung, colic pains, weak pulse, prostration, convulsions and stupor. Give a purge of oil, and follow with pint doses of whisky in slippery elm or linseed tea.

II. Poisoning from Stings.

It is not infrequent that animals are badly stung, or bitten by venomous serpents or insects.

For the stings of insects, as wasps, hornets and bees, wash the stings repeatedly with onion juice, or ammonia three parts to one part of oil. Washing with salt and water is also an excellent remedy.

In some portions of the West and especially in the South, gnats and certain species of venomous flies come in Summer. The remedy against this is to use petroleum. When these insects are very bad it is usual to smear the unprotected parts of the animal's body with a mixture composed of one part of tar to two parts of lard. We prefer equal parts of petroleum, lard oil, and tar. Bacon drippings may be substituted for the lard oil or lard. For the stings of centipedes, scorpions, tarantulas and other venomous spiders, give the following:

No. 208. 1 Tea-spoonful of ammonia,
1 Pint of whisky.
½ Pint of warm water.

Wash the bitten part with ammonia frequently, and keep it soaked therewith by means of a sponge.

Bites by venomous serpents are to be treated in the same way. The wound should be well cauterized when first discovered with an iron at a white heat. The doses of whisky we have given are full ones. One half this quantity of proof spirits given every hour with a little ammonia until relief is obtained will be proper, but in bad cases give the full dose as a first one, and always with water.

III. Poisoned Skin.

There are many weeds and plants that sometimes cause irritation and poisoning of the skin. The means of cure is to move the bowels and apply some soothing wash to the irritated parts. For injury from poison oak, poison ivy, hemlock, St. John's wort, etc., wash with a decoction of golden seal three times a day, oiling the surface at night. In the morning wash away the oil with soap and warm water, and use the golden seal again. A solution of sugar of lead is also a specific for vegetable poisoning of the skin.

CHAPTER XVII.

VETERINARY SURGERY.

I. CASTRATION.—II. BLEEDING.—III. TRACHEOTOMY.—IV. PERIOSTEOTOMY.—V. NEUROTOMY.—VI. DIVISION OF THE TENDONS.

GENERAL REMARKS ON SURGERY.—Every person who has the care of farm stock, or who has the care of horses, should understand some of the simpler means used in veterinary surgery. The castration of animals, for instance, is exceedingly easy and safe if a few simple rules are observed. If done in a bungling or improper manner, the chances, except in the case of very young animals, are against recovery. Bleeding is sometimes absolutely necessary to save life. When necessary it should be promptly performed. Tracheotomy also, as cutting into the windpipe is called, must sometimes be performed before a surgeon could possibly reach the animal. Periosteotomy, as operating upon the membrane of the bones of the leg is called, had better be left to the veterinary surgeon entirely; so again, neurotomy, the division of the nerve which supplies the hoof of the fore leg with sensation, had also better be left to the surgeon. In all division of tendons, fractured limbs and various disabilities to which animals are subject, every horseman ought to know what to do. The diseases of animals have been pretty thoroughly treated of in this work. Some of the operations of surgery must therefore receive the attention their importance deserves.

I. Castration.

Calves, lambs and pigs should be castrated when quite young, always before the sixth week of their life. Lambs and pigs should be castrated at from one to two weeks old. Colts are not usually castrated until one year old, since thus they retain more of the natural vigor and style of the entire horse.

In the case of colts and old horses the structures are tough and the cords strong, consequently clamps (grooved sticks) so twined together at one end that when pressed together and tied firmly the cord will be held so tight that circulation is entirely stopped are generally used.

How to do it.—Cast the colt or horse and fasten him securely, having everything ready, a keen, round-pointed knife, clamps and cords. Seize the scrotum making a clean cut through the integuments and well into the testicle, and in a line so the cut shall be parallel to the median line, or line dividing the scrotum. Clean the envelop of the testicle, leaving it as near intact as possible, as the envelop must remain with the animal. Draw the testicle out, put a clamp on the cord and seizing the other end of the clamp with a pair of pincers press it strongly together, and tie securely with a waxed thread. So proceed with the other side. The horse may then be allowed to get up. In thirty-six to forty-eight hours, the sticks are to be removed by cutting the strings.

Another mode, and a most excellent one, especially in the case of colts, is after freeing the testicle of its envelop and exposing the cord, to seize the artery beyond where it is to be secured, with a pair of pincers made for the purpose, cut the cord and twist the artery seven or eight times; let go, and with its retractive force it will retain the twist and prevent all bleeding. Another way is to tie the artery and allow the ends of the strings to hang out of the orifice. The plan by torsion, twisting by the pincers, is the plan to be preferred.

In castrating, do not be afraid to make an extensive cut, and do not leave the cord too long, else it may be strangulated, and fever and inflamation ensue. If this should unhappily occur, enlarge the opening and push up the cord. If there is formation of matter, hasten it by fomentation with warm water. When a free exudation of cream-like matter is established, the animal will go on to recovery as granulation progresses. Wash the parts daily with tincture of aloes and myrrh. If, however, the work has been properly done, the animal will suffer little inconvenience, and nothing more need be done.

The best time for castrating colts and horses is from the middle of May to the first of June, in the North, and in the South about the time the young grass is a full bite.

II. Bleeding.

There are cases where bleeding must be resorted to to save life. These are brain disorders and some forms of inflammatory disease. The jugular vein is the one to be bled from, and when the object is to deplete the system, six, seven, and even eight quarts should be taken. Always catch the blood in a vessel, as it is neccessary to know how much we take.

By pressing on the jugular vein along the neck, below the spot selected for the incision, it will soon rise up prominently. In bleeding, always make the incision in the line of the vein, never across it. Make the incision large, but never through both walls of the vein. When sufficient blood has been taken, raise the lips of the vein between the fingers, thrust a pin through and wind some thread dipped in the blood about it to hold it.

In staggers and diseases of the brain, it is usual to bleed in the roof of the mouth.

Whenever a horse is to be bled, it is better to blindfold him, since it prevents his starting, and thus causing a miss with the lancet or fleam in the hands of an inexpert person.

III. Tracheotomy.

The operation of tracheotomy consists in cutting down into the windpipe, in all desperate cases where the animal is likely to suffocate for want of breath. In bad cases of strangles, or other obstruction to breathing, it is sometimes necessary to save the life of the animal, and there is no time to wait for a surgeon.

How to do it.—Have an assistant hold the horse's head high, with the nose extended, so as to best stretch the skin of the neck. Then feeling along the neck for that part least covered with flesh, make a bold incision with a sharp knife—one with a round point, and thin, being preferable. Make the incision about four inches long, and along the central line of the windpipe, and down to it. Then with a sharp-pointed knife pierce one of the upper exposed rings of the windpipe, cut downward along the central line, dividing two or three of them; introduce a tracheotomy tube, which has a movable collar to prevent going in too far, and fasten its strings around the neck to hold it in place. The spout of a tea-kettle has been extemporized as a tube, and with good effect. This tube must be allowed to remain until the animal can breathe through the nostrils, when the wound may be sewn up and treated as any other clean cut.

IV. Periosteotomy.

This is cutting down to the bone, and through the periosteum, the nervous vascular membrane immediately investing the bone, and which in health has little or no sensibility, but which in disease of the bones is exceedingly sensitive. It is sometimes performed in inflammation of the shank bone, when exudation has taken place between the membrane and bone, giving rise to thickening and the formation of bony matter.

How to do it.—Pass an extremely narrow-bladed knife through the skin half an inch below the swelling, and carry the point carefully up over it, dividing the periosteum or membrane. Then cover with a wet bandage, or put in a seton.

A better way is first to make a snip above and below the tumor with a pair of roweling scissors. Then with a blunt seton needle fixed in a hollow handle by means of a screw, and armed with a tape knotted at the end, force it in at the lower snip and carry it up and out at the other, breaking down the cellular tissue of the tumor. A probe-pointed knife is then introduced slicing the tumor. The knife is withdrawn, and the needle, released from the handle, is passed in at one opening and out of the other, the end withdrawn from the needle and thus the seton is fixed. The operation should be performed by a surgeon. The first operation, simply cutting through the periosteum, is altogether the better course.

V. Neurotomy.

This is the division of the nerve of the hoof in navicular disease when other means fail. It will give relief from pain, but it is no cure, and generally the disease goes on advancing until the animal becomes worthless. We should never advise the operation upon an animal with a weak hoof. The operation must of necessity be performed by a competent surgeon who understands the anatomy of the foot and leg.

VI. Division of the Tendons.

There are some disabilities, as bad cases of knuckling over, carrying the tail awry, or only the toe of the hind leg may be able to be put to the ground, from contraction of the perforans tendon. Relief is obtained by division of the tendons, but it should always be done under the advice of and by a competent surgeon and with proper instruments.

CHAPTER XVIII.

MISCELLANEOUS MINOR DISEASES.

I. PIGMENT TUMORS. — II. EPITHELIAL CANCER. — III. DROPSY OF THE LUNGS. — IV. STINGS AND BITES. — V. FALLING OFF OF HAIR. — VI. ACUTE IRRITATION OF THE SKIN. VII. HARDENING OF THE SKIN. — VIII. EXOSTOSIS OF THE LOWER JAW. — IX. SWELLING BY PRESSURE OF THE BRIDLE. — X. SORE NOSE. — XI. ROARING, OR HIGH-BLOWING. — XII. WIND-GALLS. — XIII. RUPTURE OF THE HAMSTRING. — XIV. INTERNAL HEMORRHAGE. — XV. PARTIAL PARALYSIS.

I. Black Pigment Tumors.

Those black pigment tumors known by the learned name of Melanosis, and which are so common in gray and white horses, attacking the bare parts of the skin, as the anus, the vulva, the sheath, the udder, the lips, the eye-lids, etc., are occasionally cancerous, but for the most part quite harmless. If they are deemed objectionable, as disfiguring the animal, remove them with the knife.

II. Epithelial Cancer.

This is a nipple-like cancer, which sometimes appears on the lips of horses. It should be promptly removed with the knife, after which the part should be burned over with lunar caustic.

III. Dropsy of the Lungs.

This results from valvular and other diseases of the heart. When the ear is placed to the chest, and the horse struck on the other side with the open palm, the sound heard is nearly the same as that heard in pneumonia; but it may be distinguished from pneumonia by the entire absence of fever which characterizes lung dropsy. It is usually beyond medical reach, as the diseased heart, its original cause, is generally incurable.

No treatment, in addition to that already prescribed for heart disease, can be recommended.

IV. Stings and Bites.

Hornets, wasps and bees often attack horses, and sometimes cause them serious injuries. To relieve a case of this kind, we use one of the following remedies, with which the coat must be thoroughly saturated: Solution of ammonia; weak carbolic acid wash, (1 ounce to a quart of water); 1 pint of lime water, in which 1 drachm of carbolic acid is dissolved; or oil of lobelia.

Cases are recorded of horses having died in consequence of an attack of bees. In ordinary cases, the preceding direction properly carried out will be sufficient; but in more aggravated ones, sponge the whole body with lime water, and then smear with linseed oil. If lime is not accessible, use a weak solution of soda. Spirits of turpentine and laudanum, in equal parts, will give relief.

To prevent the stings of gad-flies, make a strong infusion of the green bark of the elder, and wash the flanks before going out. To prevent the bites of buffalo-gnats, that are so troublesome along the lower Mississippi, cover the parts most likely to be attacked with a mixture of tar and lard —two parts of lard to one of tar.

V. Falling Off of Hair.

For that unwholesome state of the skin and hair glands known by the learned terms of humid exanthema and dry exanthema, that causes the falling off of the hair, the following is an excellent local remedy when the animal is not under general treatment for some disease primary to the state now under consideration:

No. 209.
1 Ounce pulverized charcoal,
1 Pint olive oil,
5 Ounces pyroligneous acid,
1 Ounce common salt.

Mix, and rub upon the parts daily with a sponge or a soft rag.

VI. Acute Irritation of the Skin.

For that acute irritation of the skin consequent upon clipping, with which some horses suffer so much, wash twice a day carefully with a solution of soda (2 ounces of soda to a bucket-full of water). If the horse is especially feverish and sore, give the following purgative:

No. 210.
8 Ounces castor oil,
2 Ounces tincture of aloes,
2 Drachms essence of peppermint.

In grooming, use a soft brush, and discard the curry-comb until the soreness and tenderness are gone.

VII. Hardening of the Skin.

For that hardening of the skin which takes place in consequence of the pressure of some portion of the harness, from cutting the integuments and sub-cellular tissue, from the calkings of the shoes, from cauterized fungi, etc., use the acetate of cantharides as an application to the indurations:

No. 211. 1 Ounce acetate acid,
5 Ounces water,
1 Ounce pulverized cantharides.

Mix, and let the mixture stand fourteen days to soften. Then filter through linen or blotting paper, and add one ounce of spirits of wine. Apply it occasionally by means of a bit of sponge. Or, use equal parts of oil of turpentine and olive oil applied in the same way.

VIII. Exostosis of the Lower Jaw.

TUMOR CAUSED BY CURB-CHAIN.

That unnatural enlargement or bony excrescence of the lower jaw, known by the above name, is generally caused by a tight curb-chain used with a curb-bit of such leverage as to enable the rider to inflict injury by violent jerking. The jaw-bone is bruised, and soon enlarges. The injured portion must exfoliate, or scale; and the presence of this unnatural substance under the flesh and tendons gives rise to a foul ulcer, unless steps are taken to give relief while the hurt is comparatively recent.

Nature makes a constant effort to heal, however, and unless the tumor is irritated by passing particles of bone, it partially heals, so that an obstacle is interposed from time to time to the escape of the scales; and in this way an unnatural bony structure is formed and matured before the bony tumor is entirely healed. To prevent this, open with a keen knife, as soon as the bone is found to be injured, and keep the wound open by using the elastic syringe and warm water, until the discharge has assumed an offensive odor—then syringe into it several times daily, this solution:

No. 212. 1 Scruple chloride of zinc,
4 Drachms essence of anise seed,
1 Pint water.

If taken in time, and treated in this way, the healing may take place without deformity.

When once the bony excrescence has established itself, no one but a skillful veterinary surgeon should be entrusted with its removal.

IX. Swellings by Pressure of the Bridle.

These, as the designation indicates, are swellings, sometimes sores, and occasionally, when of old standing, callous lumps, made by the pressure or rubbing of the bridle upon that little prominence on the neck just below and back of the root of the ear. If the swelling is simple and recent, remove by saturating it with the camphorated corrosive sublimate (No. 2) and drying in with a hot flat iron, held close without touching. This must be attended to once a day, and the bridle must be kept off during treatment. If there is a sore without fungous growth (proud flesh) the same treatment will be found effective.

If the tumor is of old standing and fungous, the proud flesh must be burned away with lunar caustic. If it is old and horny, resort must be had to the knife, after which the wound may be healed by a dressing of simple cerate, or of any of the unctuous oils.

X. Sore Nose.

The nose sometimes becomes sore from long-continued purulent discharges, from any irritating substance introduced, but generally from grazing near some irritating weed or vine. Jamestown weed will often poison the noses of horses, yet the leaves, buds and pods are eaten with impunity. So-called "sneeze weed" will also irritate the nose and cause it to become sore. As a rule rubbing the nose with mercurial ointment in which equal parts of sulphur and lard has been intimately mixed will effect a cure. Apply with a mop, if out of reach of the hand, to be rubbed in as well as may be possible.

XI. Roaring and High-blowing.

This is when a horse emits any unnatural noise in traveling, whether he simply be thick winded, or emits the peculiar noise when hard urged, or the sharp sound denominated whistling and piping, similar to roaring, but a more confirmed type, occasioned by a strong closing of the rima glottidis. Whistlers are simply chronic or confirmed roarers, and roaring precedes whistling. Both impediments to breathing are produced by atrophy or wasting or degeneration of the muscles whose office it is to dilate the larynx.

Thick wind is from an inflamed and thickened condition of the smaller

and lower branches of the breathing tubes, whistling from a narrowing or constriction of the windpipe. Roaring, again, is of two kinds, acute and chronic. The first is, in comparison with the chronic and confirmed state, light and trivial. Fortunately it is comparatively rare in the United States, but quite common in England, and essentially a disease of high or well-bred horses.

True high-blowing, as understood by English horsemen, is not considered a disease or impediment. There is no sound made during inspiration. The air is expelled during and after hard exertion, with force and a peculiar vibration of the nostrils, causing the sound.

Causes.—Any and all of these impediments are produced by various affections, and some of them, as thick wind and roaring, are considered by some as hereditary. Laryngitis, distemper, bronchitis, pneumonia, tumors, diseases of the nasal membranes, and tight reining. Roaring and whistling are decided unsoundness. So also should thick wind be considered, if the horse is to be used for any other than slow work.

How to know it.—One of the means used is to go into the stall, take the horse by the head, and make a motion as though to strike him across the side with a stick. The animal will probably spring towards the manger, and if a roarer, the peculiar grunt accompanying the habit will be made. Yet it must be admitted that some horses, under the impulse of sudden fear, will grunt. The best test is to put him to speed more severe than usual. If the trial is objected to, be sure there is something wrong, and be sure also that there are no straps about the neck to prevent or ease the habit. In addition to the ordinary sound made by roarers, they often, indeed usually, have a loud, hard, sharp cough, between a cough and a roar. If occasioned by laryngitis, this cough will be indicative of the chronic stage of that disease. So a thick-winded horse will have a short, hard, dry cough, which he will give upon making any sudden movement, or upon being struck sharply upon the abdomen.

What to do.—Remedies are of but little avail, except as palliations. In slight cases, and during the earlier stages, swabbing the larynx with a solution of nitrate of silver has given relief. It is prepared by dissolving at the rate of ten grains of nitrate of silver to each ounce of distilled water, and is applied by means of a small, soft sponge fixed on the end of a piece of whalebone, the sponge having a cord attached and longer than the handle, so as to be recovered if it comes off. Pads have been attached to the nose-band of the bridle, so as to lie on and compress the false membrane of the nose. These have given relief if the horse is not required to make extra exertion. Firing or blistering about the region of the larynx has also been successfully used as a means of relief.

When roaring is caused by paralysis of the muscles of the larynx, hypodermic injections of strychnine every two or three days in half grain doses has given relief.

Relief is also sometimes given by rubbing on daily, or once in two days, the following:

No. 213. 1 Drachm iodine,
2 Drachms iodide of potash,
2 Ounces lard.

Mix at a heat little more than to melt the lard, by placing in a vessel of hot water.

In all of the diseases mentioned, good, easily-digested food should be given, and only sufficient water to satisfy the actual demands of the system, and the animal should not be put to work within an hour of eating his food.

Thick Wind.

This may be alleviated, and sometimes cured, by giving the following ball once or twice a day for several days in succession, as the animal may seem to need it:

No. 214. 1 Drachm powdered camphor,
1 Drachm powdered niter,
1 Drachm powdered opium.

Or if preferred, to be given once a day, until five or six doses are taken, the following:

No. 215 1 Drachm powdered niter,
1 Drachm extract belladonna.
8 grains arsenic.

XII. Wind-galls.

Causes.—Windgalls may arise either from strains, over exertion, or dropsy of the parts. As a rule they are elastic, round swellings on each side of the tendons, rarely becoming solid from coagulation of the lymph, unless as is occasionally the case, the strain is so severe as to cause inflammation of the bone, ulceration and bony deposit. They do no injury whatever, and do not cause unsoundness.

What to do.—If the puffs, windgalls, are just appearing they may be scattered sometimes by a strong decoction of white oak bark and alum. They may be reduced by blistering from subsequent contraction of the skin; so the liquid lymph may be drawn out with a hypodermic syringe, after which a wet bandage should be applied over the part

If there is heat and tenderness in connection with the windgalls it must be treated with fomentations and a high-heeled shoe as recommended for such disabilities. As a rule simple windgalls being so common, often appearing on colts, and doing no injury, had better not be meddled with unless there is inflammation attending them.

XIII. Rupture of the Hamstring.

Not only the hamstring but other sinews are subject to rupture or even division. In this case the parts should be brought together and held so by starch bandages or splints or both, when fibrous tissue will form and the ends will unite in three, four, or five weeks. If inflammation occurs it must be treated as heretofore advised.

XIV. Broken Wind.

HOW TO HEAR THE SOUND MADE IN THE HORSE'S WINDPIPE.

A horse with broken wind is in pretty much the same condition as a man with the asthma. It is said often to occur suddenly, as after unusual exertion, or after severe work upon a full stomach. The facts are, these may have aggravated and suddenly made apparent symptoms not noticed before. There is no cure, but much may be done to alleviate the distress and enable the animal to do ordinary slow work.

How to know it.—There is often, for a long time previous to a severe attack, more or less cough—a short dry hack, and occasioned by irritability of the larynx. The appetite is often ravenous and morbid, the thirst excessive. As the disease progresses there is flatulence, a pendulous belly, a ragged coat, and a general dejected and unthrifty appearance.

In breathing there will be a three-fold effort. The inhalation will be quick, the expiration slow. Then the abdomen will rise as in an effort to drive forward the diaphragm, and thus empty the half expired lungs. The two last efforts seem laborious, and the double effort is often only partially completed when the animal is again forced to gasp for breath.

In the earlier stages the peculiar sound made is in the windpipe. The cut given will show the manner of listening to sounds for throat difficulties. Every horseman should accustom himself to recognize not only the sound indicative of healthy breathing but also those given out in various diseases of the throat. No horse with heaves or broken wind should be driven immediately after eating. The food should be sound, and water should be given only in small quantities.

XV. Internal Hemorrhage.

Internal bleeding or hemorrhage is rare unless made by puncture of some of the deep-seated blood vessels. The orifice leading to the surface being obscure and high, will of course occasion internal bleeding. When they can be got at the remedy is of course tying. Punctured wounds do not bleed much, the clot usually closing the orifice, assisted by the contraction of the vessel. In transverse or oblique clean cuts of an animal causing wounds to the important arteries death must follow unless they can be cut down upon and tied.

Rupture of the blood vessels of the lungs sometimes occurs from over exertion, and is also common from the nose. Or hemorrhage of the lungs may arise from any pulmonary complaint involving the blood vessels. In this case it must be determined. If the blood comes from both nostrils and is frothy, it is from the lungs. If the horse has no specific disease of the lungs, and is in full flesh, bleeding from the neck vein, a full stream, may check the blood. Digitalis in fifteen grain doses may be given. It may give present relief, but probably there is no permanent cure.

INTERNAL HEMORRHAGE.

If the bleeding is from the blood vessels of the nose, a strong solution of alum may be syringed up the nostril. If this fails, pour half a pint of boiling water on a drachm of matico leaves, and when cool strain and inject it up the nostril.

Chronic hepatitis, congestion and inflammation of the liver, often results in hemorrhage internally. The symptoms confirming this state of things are, the mouth cold, nasal membranes pallid, the eyes ghastly, sometimes yellow. The horse will look for the seat of pain on the right side, and usually lies on the left side when down. The head is depressed. As the disease progresses there is increased weakness with staggering. The pupils of the eyes are dilated; the sight is bad, and if the head is attempted to be raised high the animal instantly shows signs of falling.

What to do.—Put the animal in a roomy stall, or loose box. Keep the bowels regulated by grass and bran mashes only, with nutritious food and as much gentle exercise daily as the animal can take. Prepare the following:

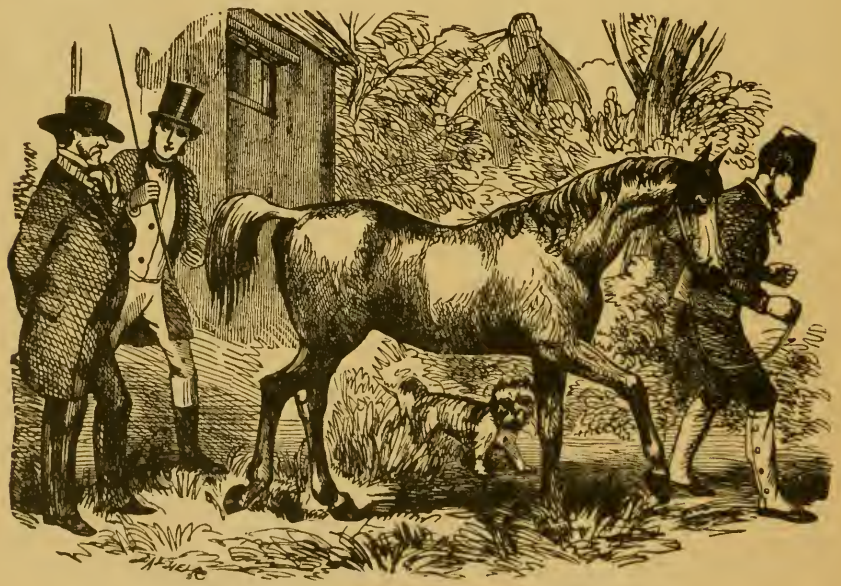
No. 216. 2 Ounces iodide of potassium,
1 Quart liquor potassa.

Mix, and give two table-spoonfuls twice a day in a pint of water.

V. Partial Paralysis.

This is a disease principally confined to fast driven horses, or those used to extreme exertion. It is also occasioned by ergot in the hay or grain and then is known as ergotism. An injury to the brain may cause paralysis of the opposite side of the body. So paralysis of the face, body or limbs may arise from pressure on the brain. Paralysis of one side of the body, called hemiphlegia, may result from disordered brain or spinal cord. So paralysis of the face, ear, eyelid, lip, tongue, larynx and tail may arise from local causes. A current of cold air continually striking a part, bad fitting bridles, collars, or other parts of the harness. Paralysis of the hind limbs is the most common form and may result from injury to the loin or back, from indigestion, from tumors, parasites, inflammation or softening of the spinal cord, from eating freshly ripened seeds of some of the grasses (the loliums) as darnell, flax rye grass, and perennial rye grass.

What to do.—The cause must first be found. See articles on inflammation, poisons, indigestion, etc.



HORSE SUFFERING FROM PARTIAL PARALYSIS OF THE HIND LEGS.

If the paralysis proceeds from an incurable disease it is to be treated by cold water shocks and subsequent friction by rubbing. Among the best means is a current of electricity daily.

The following ball has resulted in relieving the difficulty when it was partial paralysis of the hind limbs:

No. 211. ½ Grain strychnine,
½ Grain iodine.

Work this up into a ball with powdered quassia and molasses and give daily, gradually increasing the strychnine according to its effects, so that at the end of three weeks one grain will be given daily, and, if good effects are produced, a grain and a half may be given daily at the end of five or six weeks.

Paralysis is, however, past cure. Something may be done for present relief, but each recurring attack is more and more severe. The most strengthening food should be given and the best of care, always being careful that the animal be not subject to cold drafts, or extraordinary labors. During the recurrence of the attacks, absolute rest and quiet must be given. In the giving of nerve stimulants, as strychnine, when increasing the doses gradually, if twitching or slight cramps of the muscles are observed, cease giving for a few days and then begin again with the smallest dose.

CHAPTER XIX.

MEDICINES.

What to Keep, How to Obtain, How to Prepare, and How to Give Them.

I. ALTERATIVES.—II. ANÆSTHETICS.—III. ANTISEPTICS.—IV. ASTRINGENTS.—V. CATHARTICS.—VI. CARMINATIVES.—VII. COUNTER IRRITANTS.—VIII. CAUSTICS.—IX. DIAPHORETICS.—X. DIURETICS.—XI. DEMULCENTS.—XII. DISINFECTANTS AND DEODORIZERS.—XIII. EMETICS AND EXPECTORANTS.—XIV. NARCOTICS, ANODYNES, AND SEDATIVES.—XV. RELAXANTS.—XVI. STIMULANTS.—XVII. TONICS.—XVIII. VERMIFUGES.—XIX. IMPORTANCE OF SYMPTOMS.—XX. DISSECTION.—XXI. SURGICAL AND OTHER INSTRUMENTS.—XXII. MEDICINES TO BE KEPT.—XXIII. DOSES.

It is not necessary that every farmer should keep a large quantity of medicines on hand. A few simples will suffice, except in the case of those who, having a large stock of animals, require medicines to meet cases apt to arise. The great point we have insisted on, and here reiterate, is good care and attention, in health, and good nursing in sickness, as being most important in the care of farm animals. The day has past for bleeding and purging for every ill that even horse flesh is heir to. Good nursing, attention to the general health, and to symptoms, with the prescriptions we have given, will enable any one to carry an animal through an ordinary sickness.

Every person who has carefully studied this work will see the necessity of keeping some medicines on hand, since there is no reason why, with the aid of what we have presented, he may not be able to treat nine in ten of the diseases to which farm animals are subject, and without the aid of a professed veterinary surgeon. The very full glossary which will be found as a part of this work, should be consulted for medical terms used when the definition does not immediately follow the use of the term. In naming the medicines and their effects in this chapter we shall give definitions that may be found in the glossary, since in the division of the subject of medicines it seems proper that we should follow the rule adopted of defining the meaning of terms in the body of the work. The operations of medicine may be defined as follows:

I. Alteratives.

Medicines acting generally and continually on the system, especially on the blood and glandular system. Among the alteratives are, antimony,

niter, sulphur, ginger, calomel, arsenic, iodine, iodide of potassium, sulphite, or bi-sulphite of soda.

Antimony.—Black sulphuret of antimony. Dose 1 to 2 drachms. Given in connection with sulphur, 1 to 2 ounces, and niter 4 to 6 drachms.

Ginger.—Given as an alterative only in connection with other medicines.

Calomel.—Give in broken doses, say 1 scruple. Another form of mercury, sulphuret, give 3 drachms once a day in connection with 4 drachms cream of tartar in a pint of water. This has been recommended in obstinate cases of surfeit, and other affections of the skin.

Arsenic.—Dose 5 to 10 grains daily. It should only be used under the direction of a veterinarian. Its action is principally on the nerves. Fowler's solution of arsenic contains 4 grains to the ounce. It is the best form in which to administer the mineral.

Iodine.—As an alterative give 10 to 20 grains.

Iodide of potassium.—Dose 1-2 to 1 drachm. Valuable in chronic rheumatism, chronic cough, scrofulous enlargements, and to cause absorption in pleurisy, and inflammation of the lungs.

Bi-sulphite of soda.—This must not be confounded with sulphate. Dose 1-2 to 1 ounce relieves tymphany.

II. Anæsthetics.

These remedies benumb the senses, relieve pain, and are used largely in destroying sensation in performing principal surgical operations. All that will be necessary to notice are:

Chloroform and Ether. The best and safest preparation is the following:

No. 218. 1 Ounce alcohol,
2 Ounces chloroform,
3 Ounces ether.

Cast the animal to be operated upon; pour a table-spoonful on a sponge and hold to the nostrils so that the animal can take some air with it, since if not mixed with air, it is fatal to life. Keep the fingers on the pulse, and if it ceases, or intermits decidedly, discontinue, and hold hartshorn to the nose, and commence again more lightly. So soon as unconsciousness is produced, suspend the use of the anæsthetic, and renew again from time to time, until the operation for which it is given is completed.

Sometimes the animal will continue low for some time after the administration, with failing pulse and irregular breathing. If so, pour pails of cold water on the body, and if necessary, gently inflate the lungs with a pair of bellows, at the same time pressing upon and releasing the ribs, as in natural respiration. Also press pieces of ice into the rectum, or

vagina, according to the sex, as an additional means of restoration, if necessary. As the natural functions again act, clothe the body and rub dry. From two to four minutes should be sufficient to produce complete insensibility in either the horse or ox.

III. Antiseptics.

These are used to arrest mortification and putrefaction. The principal agents are charcoal, creosote, pyroligneous acid, sulphate of zinc, and yeast. They should be applied directly to the parts affected.

IV. Astringents.

These are agents used to stop or lessen discharges, either of the bowels, nose, blood vessels, kidneys or glands, and are applied both internally and externally. Among those usually employed, are, acetate of lead, alum, catechu, ergot, kino, opium, per sulphate of iron, tannin, the mineral acids, and gallic and tanic acids.

They should not be used when there is considerable inflammation; nor for diarrhœa, in the beginning of a difficulty, since this flux is often an effort of nature to relieve the body by natural means.

Acetate of lead.—Dose, 1 to 2 scruples. As a wash, use a saturated solution.

Alum.—Dose, 2 to 3 drachms; useful in sore throat and dysentery. In powder, used for stopping the flow of blood.

Catechu.—Dose, 2 to 5 drachms. Useful in diarrhœa.

Ergot.—Dose, 1-2 to 1 ounce. Checks bleeding from the lungs, nose, stomach and bowels. As an astringent, for this purpose, it is better to give it by hypodermic injections, using ergotine in solution in five grain doses.

Kino.—Dose, 1-2 ounce to an ounce. Given in diarrhœa.

Opium—Laudanum.—Dose, powdered opium, 2 drachms. Laudanum, 2 to 4 ounces. It is a well known agent in relieving the spasms of colic, dysentery, lockjaw and other convulsive ailments. In diseases of the lungs and breathing tubes, if the respiration is short and quick, it should not be given. So, if there is much fever it should not be given until these symptoms abate.

Per sulphate of iron.—Dose, 1 to 2 drachms. Useful for arresting bleeding or hemorrhage.

Tannin.—Tannic acid is the best form. Dose, 10 to 20 grains. A powerful astringent in diarrhœa or mucus discharges.

V. Cathartics.

These are medicines acting strongly and directly on the bowels as a purge, in from 3 to 12 hours. Strong purgatives should not be given except it be necessary to thoroughly evacuate the bowels, and deplete the

animal system. The principal agents employed are aloes, croton oil, linseed oil, podophyllin and salts.

Aloes, Barbadoes.—This should always be used in preference to Cape aloes, which is more griping. Dose 4 to 8 drachms.

Croton oil.—A powerful and sharp purgative, valuable in obstinate constipations. Applied externally it is apt to irritate and produce blemish. Dose internally 20 drops.

Linseed oil.—A safe, and pretty sure, mild purge. Dose 1 pint to 1 quart.

Podophyllin.—This is the active principle of the May apple. It is both purgative and sedative. Dose 1 to 2 drachms. Its effect on animals is not so marked as on man. In the commencement of fevers it is excellent.

Salts.—Sulphate of soda or Glauber salts is generally used when purgative effects are required. The dose is 1 to 1 1-2 pounds. Epsom salts, sulphate of magnesia, dose 1 to 2 pounds, or 8 to 12 ounces, and repeated every three or four hours until an operation is had.

VI. Carminatives.

These are used in colic, griping, etc., and are often given with griping medicines. The principal agents are black pepper, caraway seeds, cloves, ginger, peppermint, sage, etc.

Black pepper.—Dose 2 drachms. When a quick and powerful remedy is required give 2 drachms red (cayenne) pepper.

Caraway.—Dose 1-2 to 1 ounce of the seeds, as a powder, or as an infusion.

Cloves.—Dose 1-2 to 1 ounce of powdered cloves steeped in hot water and given warm, or 30 to 60 drops of the oil of cloves given in thin mucilage of gum arabic.

Peppermint (oil).—Dose 15 to 30 drops in mucilage. Sage or any of the heating herbs may be given as a tolerably strong infusion or tea.

VII. Counter Irritants.

These are divided into classes: Rubefacients, which simply excite the skin to redness; vesicants, which blister, and suppurants which produce sores on the surface. They are serviceable by setting up inflammation on the surface near the seat of disease, in congestion and inflammation of internal organs; also of the bones, joints and tissues. Rubefacients are good in influenza, and other attacks of a general nature, where there is low fever; as, for instance, rubbing a paste of mustard on the legs and washing it off in ten or fifteen minutes. Vesicants should not be used when fever or inflammation is high, and suppurants are chiefly of value in old chronic complaints.

Rubefacients.—Alcohol, ammonia, mustard, turpentine.

Vesicants.—Cantharides, scalding water, and a hot iron at 212 degrees, Fahrenheit.

Suppurants.—Croton oil, ointment of tartar emetic.

VIII. Caustics.

Agents which burn and destroy the flesh. Used to kill the virus in poisoned wounds, eat out proud flesh, destroy sloughs, and stimulate old ulcers; to produce healthy action in fistulas, and remove warts and other excrescences. Among the best agents are butter of antimony, caustic potash, chloride of zinc, lunar caustic (nitrate of silver), nitrate of mercury, nitric acid, and the hot iron at a white heat. Chloride of zinc and nitrite of silver come in pencil shaped sticks. Nitric acid must be used with care. It is powerful and intensely eating, causing extreme pain, but which soon ceases. It may be used by dipping a suitable slip of wood in the acid and applying. The hot iron is the most powerful caustic, as it is the most efficient. It however requires nerve and judgment to use it properly and efficiently.

IX. Diaphoretics.

These are medicines to cause sweating or to increase the insensible perspiration, and thus relieve pressure on other organs. Acetate of ammonia in solution, Dovers powder, ipecac and cantharides are mainly employed; the animal being covered quite warm. Warm water is also useful, but steaming the most prompt of all.

Acetate of ammonia.—Solution. Dose, 2 to 3 ounces.

Dover's powders.—Dose, 3 drachms.

Ipecac.—Given in 2 to 3 drachm doses in warm water, until the effect is produced. Not especially useful for horses.

Cantharides.—Dose, 4 to 5 grains.

X. Diuretics.

These are medicines used to act on the kidneys. Saltpeter, sweet spirits of niter, cream of tartar, turpentine and digitalis are principally used.

Saltpeter.—Dose, 6 to 8 drachms.

Sweet spirits of niter.—Dose, 1 to 2 ounces.

Cream of tartar.—Dose, 1 ounce.

Turpentine (Oil).—Dose, 1 to 2 ounces.

Digitalis.—Dose, 15 to 20 grains.

Both diuretics and diaphoretics are similar in their action. If sweating is intended, it must be assisted with warmth and friction. If operation

on the internal organs is required, warmth and friction should not be used.

XI. Demulcents.

These are gummy or glutinous substances, used to soothe and cover inflamed surfaces, or those in an irritable condition; as inflammation of the throat, stomach and bowels; in diseases of the kidneys, or for irritable conditions generally. Those most in use are: Linseed tea, gum arabic water, slippery elm bark tea, starch water and olive oil. Marsh mallows makes one of the most valuable agents known, being especially soothing to the bowels.

XII. Disinfectants and Deodorizers.

The most valuable of these are, sulphate of iron, chloride of zinc, carbolic acid, chloride of lime, used for disinfecting and deodorizing drains, etc. The cheapest is a solution of sulphate of iron, a good handful dissolved to each bucket of water used. As an atmospheric fumigant and disinfectant, the following is cheap, and one of the best known:

No. 219. ½ Pound flowers of sulphur,
2 Pounds pine tar.

Mix with a gentle heat, saturate tow with it and burn without flame.

Carbolic acid in weak solutions, or crude carbolic acid in its liquid, impure form, as it comes from the gas works, is valuable for brushing over any wood, iron, brick or stone work. Also valuable for wetting cloths, and hanging up to destroy disease germs, keep away flies, etc.

The following formulas will be found valuable disinfectants:

No. 220. 1 Part sulphate of zinc,
1 Part powdered oak bark,
2 Parts sulphate of iron.

Mix into balls of proper size and place in drains, sink-holes and cesspools.

Collins' disinfecting powder is made by adding 1 part of burnt alum to two parts of chloride of lime. Pour on water to thoroughly wet the mass, and set in shallow pans about the stable.

The following is a powerful disinfectant:

No. 221. 2 Pounds common salt,
1 Pint oil of vitriol.

Pour the oil of vitriol gradually and slowly over the salt, and the active disinfectant, muriatic gas, will be evolved.

The following, known as chloralum, is not poisonous, and has no smell. To make it take,

No. 222. 1 ½ Pounds chloride of aluminum,
1 Gallon water.
Dissolve.

A most effectual, powerful and cheap disinfectant, but poisonous, if taken, is made as follows.

No. 223. 8 Ounces chloride of zinc,
16 Ounces sulphate of iron,
1 Gallon water.
Dissolve.

A pint mixed in a gallon of water will be quite strong enough for use.

XIII. Emetics and Expectorants.

What would act as an emetic on man, would be simply a nauseant with the horse. The horse does not vomit, nauseants act to loosen a cough, and to loosen the mucus in the air passages, and thus facilitate its expulsion. Nauseants also act as a substitute for the old practice of bleeding. Tartar emetic, blood root and sulphate of zinc are among those usually employed.

Tartar emetic.—Dose, 1 to 1 1-2 drachms, in connection with lobelia and saltpeter.

Blood root.—Dose, from 2 to 4 drachms of the powdered root.

Sulphate of zinc.—Dose, 1 to 2 drachms.

Tartar emetic.—This is often employed in connection with saltpeter and lobelia. Dose, tartar emetic 1 drachm; saltpeter 1 ounce; lobelia 1 drachm.

XIV. Narcotics, Anodynes and Sedatives.

These run one into the other, and are used to soothe pain, allay the irritability of the system, and quiet excessive nervous action. Narcotics quickly quiet the system, induce sleep, and if taken largely, produce *death*. When given simply to allay pain, they are called anodynes. The action of a sedative is to lower nervous force, reduce the pulse and abate febrile symptoms, especially in the beginning of acute inflammation.

Narcotics.—Opium, or its preparations, laudanum and morphia, belladonna, tobacco and Indian hemp.

Opium is generally given as a tincture, in the form of laudanum. Dose, 1 to 2 ounces.

Morphia.—Dose, 3 to 5 grains.

Belladonna.—Dose, 2 ounces.

Indian hemp.—The dose of this drug 1-2 to 1 drachm.

Sedatives.—Aconite, tincture. Dose, 20 to 30 drops.

Veratrum viride.—The dose of this is 1 scruple.

XV. Relaxants.

These deprive the muscles of their power. Of this class lobelia should be given in doses of 1 to 2 drachms.

XVI. Stimulants.

These are, alcohol, and are given in the form of brandy, whisky, rum, gin and ale. The latter when an animal is exhausted by hard driving. The dose of brandy, whisky or gin is 3 to 6 ounces, and of alcohol 1 to 3 ounces diluted with water. Other stimulants are: ether, dose, 1 to 2 ounces; carbonate of ammonia, dose, 2 to 4 drachms; turpentine, dose, 1 to 2 ounces; and ginger, dose, 1 ounce. The ginger to be given as a tea.

Stimulants are used when it is necessary to quickly raise the animal from exhaustion. In nervous exhaustion its effects are marked, but it must not be given in inflammation or fever.

XVII. Tonics.

Tonics sharpen the appetite, increase the nervous vigor, and thus improve the condition of the patient. Many horsemen are fond of giving condition powders, the main value of which lies in the alteratives and tonics contained. In this they suppose that they are beneficial to already healthy animals. Nothing could be farther from the truth. They are not beneficial unless the animal is out of condition and the system needs rallying. To get the best effect from tonics, they should be given in light doses, and continued for a considerable time. Then intermit for a few days, and if necessary, commence again, or substitute another tonic. The mineral tonics, sulphate of iron, sulphate of copper and arsenic are more active than the vegetable tonics, Peruvian bark, gentian, quassia, etc., though often the two forms combined act with greater efficacy.

XVIII. Vermifuges.

These are medicines supposed to be useful in expelling worms.

For round worms, common salt, to be licked at will, is one of the best agents to expel them. Oil of turpentine 1 ounce. Tartar emetic 2 drachms and sulphate of iron 2 drachms; give five or six days in succession, and follow by a purge. Four to 6 drachms of aloes is one of the best direct vermifuges.

Tape worm.—Oil of turpentine 1 ounce doses; or root of male shield fern, 1 ounce of the extract. Give all vermifuges fasting, and at the end of four hours give a purge of aloes. For weak animals give areka nut 1 ounce.

In using a vermifuge it is always better to clear the bowels before giving it, and in case the worms are in the intestines give injections as well

as a purgative by the mouth. It should be remembered that vermifuges that destroy by mechanical irritation, as iron filings, pounded glass, etc., should never be given.

From the foregoing the action of the different classes of medicines will be learned. Some of the more common we have given as examples. In the vast list of drugs used in medicines, and which are drawn alike from the animal, vegetable and mineral kingdoms, and some of them, the most valuable, being deadly poisons, must not be given in too large doses, the practitioner cannot be too careful in their use. The doses we have given in this chapter are from medium to large. If there is any doubt in using those, especially the strong poisonous extracts or crystals use the smaller.

There are really but few medicines out of the large list that are of real and well known value in common practice. The druggist in preparing medicines, uses delicate scales and weighs accurately. It is always better that they compound the prescriptions if possible; yet, as it is not always convenient to seek the druggist, especially when a stock of medicines in ordinary use is kept, it is better to have a pair of scales and a liquid measuring glass. We therefore append a table of weights and measures as used by veterinarians:

WEIGHTS AND MEASURES.

Apothecaries' Weight.

20 grains make 1 scruple,
3 scruples make 1 drachm,
8 drachms make 1 ounce,
16 ounces make 1 pound.

Wine Measure.

60 minims, or drops make 1 drachm,
8 drachms make 1 ounce,
16 ounces make 1 pint,
2 pints make 1 quart,
4 quarts make 1 gallon.

Sufficient accuracy in fluid measure for anything not violent in its action, will be the following:

60 drops, or 1 tea-spoonful, make 1 drachm,
4 tea-spoonfuls, or 1 table-spoonful, make ½ ounce,
2 table-spoonfuls make 1 ounce,
1 wine-glassful makes 2 ounces,
1 tea-cupful makes 4 ounces,
1 tumblerful makes ½ pint,
1 tin-cupful makes 1 pint.

A handful of flaxseed, or other seed, usually innocent in their nature, will weigh about 2 ounces; a handful of leaves of dried herbs will weigh about 1 ounce.

IX. Importance of Symptoms.

The importance of understanding symptoms in disease, not only of the horse, but of all farm stock, is generally underrated by farmers and stock men, and yet it is the key to all remedial means. Unfortunately, dumb animals cannot tell how they feel, and thus the practitioner must judge by outward signs, which, by the way, are pretty ample to the careful observer. These are difficult to describe in print, yet they have been so described as fully as possible in the list and treatment of diseases.

Every horse owner, and especially every stock-raiser, should educate himself to understand symptoms in such diseases as he must necessarily have to deal with. This will not be found difficult, if the reader will use the means we have presented in this work. The pulse is one of the most important agents in this direction; through this, we may get a pretty accurate indication of the state of the system in relation to fever, plethora of blood, or the reverse. It cannot well be described, and yet it is soon learned by use and observation. In the horse, the mouth is hot and dry in fever, and moist and cool in health. In health the nose of the ox is especially cool and moist, and in fever hot and dry. The full or small pulse, depends upon an excessive quantity of blood in the vessels indicating a full or a weak nutrition. A thready or wirey pulse is indicative of a small quantity of blood in the vessels, combined with an increased or diminished contractibility of the heart. A sluggish or oppressed pulse will indicate unusual fulness of the vessels, the vital powers of contractibility and sensibility not being increased, or, it may even be one or both of them being diminished. Among the internal causes operating on the pulse are irritability and nervousness. Outside causes are temperature, other atmospheric causes, and manner of feeding. The stock man who will habituate himself to feeling the pulse of his animals, will soon come to understand how slight causes will sometimes affect this agent, and thus will soon learn to detect disease, often by this indication alone. This and attention to the outward symptoms we have given in diseases enumerated, will soon enable him to dispense with the services of the practiced veterinarian, except in critical cases.

XX. Dissection.

If a farmer would, when an animal is sick, in addition to attending to studying the symptoms as they appear, take the trouble, in case it dies, to open it, with a view of studying the altered structure, knowing as he may, how they look in health, this would assist him greatly in understanding disease generally; for by this means he may find just when and how the parts affected are changed. He will thus, also, come to understand the importance of good care and nursing in the prevention and elimination of disease, more fully than by any other one means.

XXI. Surgical and Other Instruments.

With all our care it is necessary to meet disease and accidents when they come, and to this end we must be provided at least with a few simples, and the means of arriving at quantities.

To this end we have advised the purchase of a pair of scales to weigh grains, drachms, ounces and pounds; certain surgical instruments, also, and a small store of the medicines such as are in common use.

In the horse stable a balling iron should be kept. This is an iron ring through which the closed hand may be passed; on the top and bottom are two bars, which placed between the front of the jaws enable the mouth to be kept open while the hand passes the ball of physic to the root of the tongue. Sponges of several sizes should also be kept. A roomy nose-bag and an atomizer will be useful. The little India rubber bottle with which the wife sprays her plants, will answer very well in place of a better, for spraying the external surfaces.

Means for giving injections should be procured. This may be the regular horse or cattle syringe, though the pail and India rubber pipe, described in another part of the volume, will be found simple and effectual.

A drenching horn or bottle is another implement that should not be neglected. A probang should always be kept. A trocar will be found useful in case where the stomach is to be punctured to permit the escape of gas. A knife will, however, answer in its place very well, if the blade be sufficiently long and pointed. An outfit larger or smaller according to the necessities of the stock owner, may be bought in any store where surgical instruments are kept, and in fact in any of the larger drug stores of cities.

A convenient one which we have used contains: 1. A blunt-pointed bistoury, an instrument for making incisions. When only one is to be used we recommend the slightly curved form, with the sharp edge on the inside.

2. Thumb lancet. We are opposed to the old time fleam. It seems to have been invented for ignorant persons; certainly none such should ever operate, even on an animal. A little judgment will soon enable the operator to use the lancet properly and with effect, gauging the depth properly to which the puncture is to be made. It is better than the spring lancet.

3. A spring forceps, most valuable in dressing wounds, catching arteries for tying, for removing foreign substances in wounds, and for a variety of other purposes.

4. An aneurismal needle—a long blunt needle. It can be used as a probe and for introducing small setons.

5. A silver probe, for exploring wounds. It is blunt at one end and sharp at the other, and is indispensable.

6. A frog knife, a narrow straight blade, sharply curved into a strong edged hook at the end, and used for paring and cleaning the frogs of the hoofs, etc.

7. A pair of curved scissors, for trimming the edges of wounds, excising ragged flesh, clipping the hair, and for other purposes.

8. A straight, broad scalpel (knife), used in dissecting, opening abscesses, castrating, and various other surgical operations. Any straight, broad-bladed, keen-edged knife will do. In castrating, however, we have always preferred a round-pointed blade, similar to that used by nurserymen in budding.

9. A seton needle for threading and introducing tapes or other setons.

10. A few surgical needles, white thread and silk, or better, thin catgut. These may all be carried in a neat morocco case made for the purpose, and can be afforded, wholesale, at ten dollars. (In fact we will send them at that price, delivered with this book.)

XXII. Medicines to be Kept, and Doses.

The following drugs will be found handy. Keep everything in white bottles, well corked. Corrosive substances must have ground glass stoppers. The druggist, if so instructed, will arrange things. Quantities of these to be kept should be about ten doses each. 1 dose is:

1. *Acetic acid*—Antidote to acids, cooling astringent. Horse, 1 drachm; ox, 2 drachms; sheep, 1 scruple.

2. *Tincture of aconite.*—Sedative, diaphoretic. Horse, 20 to 30 drops; ox, 30 to 40 drops; sheep, 3 to 5 drops.

3. *Alcohol.*—Stimulant, diuretic, narcotic. Horse, 1 to 3 ounces; ox, 3 to 6 ounces; sheep, 1-2 ounce. Locally, cooling astringent.

4. *Barbadoes aloes.*—Purgative. Horse, 4 drachms.

5. *Alum.*—Astringent. Horse, 2 to 3 drachms; ox, 3 to 4 drachms; sheep, 1-2 to 1 drachm.

6. *Ammonia, liquid.*—Diffusible stimulant, anti-spasmodic, anti-acid, diuretic. Horse, 1-2 ounce: ox, 1-2 to 1 ounce; sheep, 1-2 to 1 drachm.

7. *Carbonate of ammonia.*—Diffusible stimulant, anti-spasmodic, anti-acid, diuretic. Horse, 2 to 4 drachms; ox, 4 to 6 drachms; sheep, 1-2 to 1 drachm.

8. *Anise seed, caraway, cardamon, fennel seed.*—Stomachic, carminative. Horse, 1 ounce; ox, 1 to 2 ounces; sheep, 2 to 4 drachms.

9. *Arnica tincture.*—Stimulant, diuretic. Horse, 1 drachm; ox, 1 drachm; sheep, 1 scruple.

10. *Asafœtida.*—Diffusible stimulant, carminative, vermifuge. Horse, 2 drachms; ox, 4 drachms; sheep, 1-2 to 1 drachm.

11. *Balsam of Peru.*—Stimulant, antispasmodic, expectorant. Horse, 1 ounce; ox, 1 to 1 1-2 ounces; sheep, 2 drachms.

12. *Borax.*—Nerve sedative, uterine stimulant. Horse, 2 to 6 drachms; ox, 1-2 to 1 ounce; sheep, 1-2 to 1 drachm.

13. *Blackberry root.*—Astringent. Horse, 2 to 4 drachms; ox, 1-2 ounce; sheep, 2 scruples.

14. *Camphor.*—Antispasmodic. Horse, 1 to 2 drachms; ox, 2 to 4 drachms; sheep, 1 scruple.

15. *Carbolic acid.*—Sedative, anodyne, astringent, antiseptic, disinfectant. Horse, 1-2 to 1 drachm; ox, 1 drachm; sheep, 10 drops.

16. *Cherry bark, wild.*—Expectorant. Horse, 1-2 ounce; sheep, 2 to 3 scruples.

17. *Copaiva.*—Stimulant, diuretic, expectorant. Horse, 2 to 4 drachms; ox, 3 to 4 drachms; sheep, 1-2 to 1 drachm.

18. *Cream of tartar.*—Diuretic. Horse, 1 ounce; sheep, 4 to 6 drachms. Laxative: horse, 5 ounces; ox, 5 to 8 ounces, sheep, 1 to 2 ounces.

19. *Ergot.*—Checks bleeding, parturient. Horse, 1-2 to 1 ounce; ox, 1 ounce; sheep, 1 to 2 drachms.

20. *Iron, peroxide.*—Tonic. Horse, 2 to 4 drachms; ox, 4 drachms; sheep, 1 drachm. An antidote to arsenic.

21. *Lime, chloride.*—Checks tympany, disinfectant. Horse 2 to 4 drachms; sheep, 1 to 2 drachms.

22. *Linseed oil.*—Laxative. Horse, 1 to 2 pints; ox, 1 to 2 quarts; sheep, 1-2 pint.

23. *Lobelia.*—Sedative, antispasmodic, expectorant. Horse, 1 to 2 drachms; ox, 1 to 3 drachms; sheep, 15 grains; swine, 5 to 15 grains.

24. *Mallow.*—Demulcent. Give freely of cold infusion.

25. *Mentha piperita (peppermint).*—30 to 60 drops.

26. *Oak bark.*—Astringent. Horse, 1 ounce; ox, 2 to 4 ounces; sheep, 4 drachms.

27 *Olive oil.*—Laxative. Horse, 1 to 2 pints; ox, 2 to 3 pints; sheep, 3 to 6 ounces.

28. *Opium.*—Narcotic, sedative, anodyne, antispasmodic. Horse, 1-2 to 2 drachms; ox, 2 to 4 drachms; sheep, 10 to 20 grains.

29. *Opium, tincture laudanum.*—Narcotic, sedative, anodyne, antispasmodic. Horse, 1 to 2 ounces; ox, 2 ounces; sheep, 2 to 3 drachms. *Of the powdered drug*, give: horse, 1-2 to 2 drachms; ox, 2 to 4 drachms; sheep, 10 to 20 grains.

30. *Pepper, black.*—Stomachic, stimulant. Horse, 2 drachms; ox, 3 drachms; sheep, 1 to 2 scruples.

31. *Pumpkin seeds.*—Vermifuge, tæniafuge. Horse, 1 pint.

32. *Rhubarb.*—Laxative, tonic. Horse, 1 ounce; ox, 2 ounces; sheep, 1 drachm.

33. *Resin.*—Diuretic. Horse, 4 to 6 drachms; ox, 1-2 to 1 ounce; sheep, 2 to 4 drachms.

34. *Soap.*—Diuretic, antacid, laxative. Horse, 1 to 2 ounces; sheep, 2 to 6 drachms.

35. *Silver nitrate* (*lunar caustic*).—Nerve tonic. Horse, 5 grains; ox, 5 to 8 grains; sheep, 1 to 2 grains.

36. *Sweet spirits of niter, Spirits of nitrous ether.*—Stimulant, antispasmodic, diuretic, diaphoretic. Horse, 1 to 2 ounces; ox, 3 to 4 ounces; sheep, 3 to 6 drachms.

37. *Tobacco.*—Sedative, antispasmodic, vermifuge. Horse, 4 drachms; ox, 4 to 6 drachms; sheep, 1 drachm.

38. *Tar.*—Expectorant, antiseptic. Horse, 1-2 to 1 ounce; ox, 1-2 to 2 ounces; sheep, 1-2 ounce.

39. *Turpentine oil.*—Stimulant, antispasmodic, diuretic. Horse, 1 to 2 ounces; ox, 1 to 1 1-2 ounces; sheep, 1 to 2 drachms. Vermifuge: Horse, 2 ounces; ox, 2 to 3 ounces; sheep, 4 drachms.

40. *Valerian.*—Diffusible stimulant, antispasmodic, vermifuge. Horse, 2 ounces; ox, 2 to 4 ounces; sheep, 1-2 ounce.

41. *Wild cherry bark.*—Expectorant. Horse, 1 ounce; ox, 1 1-2 ounces; sheep, 3 drachms.

42. *Zinc, sulphate.*—Astringent, tonic. Horse, 1 to 2 drachms; ox, 2 to 3 drachms; sheep, 15 to 30 grains.

XXIII. Graduating Doses.

In the administration of medicines the following statement of ages and doses will be found valuable in determining quantities. The doses mentioned in the preceding list being full ones:

A horse of 3 years, ox 2 years, sheep 1 1-2 years and swine 15 months old, should have a full dose.

A horse 15 months to 2 years; cattle 1 to 2 years, sheep 9 to 18 months, and swine 8 to 15 months, 1-2 of a full dose.

A horse 9 to 18 months, cattle 6 to 12 months, sheep 5 to 9 months and swine 6 to 8 months, require 1-4 of a full dose.

A colt 5 to 9 months old, calves 3 to 6 months, lambs 3 to 5, and pigs 3 to 6 months old, may have 1-8 of a full adult dose.

Colts 1 to 5 months old, calves 1 to 3 months, lambs 1 to 3 months, and pigs 1 to 3 months old, may have 1-16 of the dose.

Nervous, excitable animals require less than others. The continued use of medicines renders their action slow and decreases their power. The influence of disease also checks or modifies action. In diseases of the brain, and spinal cord, and in impaction of the stomach, double

quantities must sometimes be given, while in low fevers one-half the usual quantity may produce evil, and sometimes prove fatal.

As a rule, anodynes, narcotics, sedatives, stimulants and anti-spasmodics may be repeated once in four hours until the required effect is produced.

Twice daily may be given as the rule for alteratives, refrigerants, tonics, diaphoretics and febrifuges.

Emetics should be repeated every five or ten minutes and their action induced by opening the mouth and irritating the throat with a feather. If the animal will drink, give large draughts of slightly warm water. Emetics are not given to horses.

Purgatives should not be given the second time until the first has had full time to operate. In the horse not before 36 hours; cattle and sheep 12 to 15 hours; swine in 7 to 10 hours.

Draughts of tepid water, or warm gruel assist the operation of purgatives.

A ball is not to be made round, but longer than it is wide and not larger than a walnut for horse or ox. It must be small enough so an animal may swallow it easily. Balls are made of drugs in powders mixed into a semi-solid state with honey or molasses and linseed meal, and covered with oiled tissue paper.

Drenches (liquid medicines) are made as infusions, with warm or cold water, or as decoctions with boiling water. Powdered substances not solvent in water are mixed with thick gruel or mucilage.

A ball is best given with the aid of a balling iron. This has been previously described. Put the iron between the front of the jaws, and place the ball well back on the tongue with the hand. Hold the head well up until swallowed. This may be aided by stroking the throat next the jaws.

Liquids are given from a horn or thick quart bottle with a pretty long neck, such as a champagne bottle. No liquid or irritating medicine should be given until sufficiently diluted with water so that it will not injure the mouth if held therein some minutes.

Oil of turpentine, croton oil, and other strong irritating substances that will not mix with water, should be mixed with palm or olive oil, milk beaten with eggs, or it may be given in mucilage as the case may require.

Powerful agents, that do not irritate, act promptly injected under the skin with a hypodermic syringe. A surgeon's advice should be used in administering them.

Injections are given with a horse syringe. There are patent injectors that pump in the liquid continuously. We have described an implement that works well, by gravity, and is easily made. Small syringes are used for injecting abscesses. Also the hypodermic syringe for injecting under the skin.

CHAPTER XX.

IMPLEMENTS AND APPARATUS.

What to Keep, and How to Use Them.

Catheter.—This is a round gutta percha tube, with one end open, the other rounded and near the end with two openings. Used to draw away the water when the horse is unable to pass it naturally. They are also introduced into deep ulcers, and liquid injected through them by means of a syringe. In using the catheter, it should be well oiled and carefully and slowly pushed along the orifice or canal.

Drawing knife.—Frog knife. The knife in common use by blacksmiths; a thin blade with a sharply-curved end fixed in a handle, and used in cutting into and paring the hoof.

Firing iron.—A heavy, blunt-edged blade fixed in a handle, and sometimes used for blistering when the actual cautery is considered necessary. Valuable in skillful hands.

Forceps.—These are pincers with long jaws, and used for extracting splinters, pieces of bone, or for seizing arteries in order to tie them up.

Knives.—These should be always keen and should be both sharp and round-pointed. A heavy bistoury is a long, narrow-bladed knife for opening deep wounds and abscesses.

Lancet.—These are of three kind : the thumb lancet, the spring lancet and the fleam. The thumb lancet is gauged by the thumb, the spring lancet by a spring, and the fleam is struck by a hard wood stick. Always make the incision lengthwise of the vein.

Ligatures.—Cords for tying arteries, and in tying, a surgeon's knot should be used. Instead of passing the end of the cord once round the other, pass it twice around before drawing tight. It will hold securely.

Probes.—These are made of silver wire, with the ends slightly knobbed. They are useful in exploring wounds.

Rowel.—This is a ring of leather, an inch or so in diameter, the rim

being about a quarter of an inch wide. It is wrapped with flax or thread moistened with turpentine, and pushed down into a pocket made in the skin, to induce a running sore. They are little used now; setons accomplishing the object fully.

Setons.—A cord or ligature of leather thrust in, under and out of the skin, and tied. It is soaked with turpentine or smeared with irritating compounds, and turned every day, the object being to promote and keep up a discharge of pus, and reduce inflammation.

Seton needles.—These are broad, curved blades, with a round shaft eighteen inches long, and with an eye at the blunt end. Used for threading setons of tape, cord or leather into wounds made. Needles for sewing up wounds are of several sizes, curved, square needles.

Tents.—These are pledgets of tow, lint or other substances introduced into wounds to cause them to form matter. They should be moistened with Venice turpentine.

Twitch.—A loop of leather or strong cord, fastened securely upon a stout handle two feet long. Used for holding refractory horses, or during surgical or other operations. Pass the upper lip through the loop, and twist until sufficient force can be used to keep the animal still.

Hopples.—Ropes for casting a horse. They should be each twenty-five feet long. Have two strong straps of leather double, with a two inch seam between, and so they may be buckled tight to the fetlock. Fasten both ropes securely to the bottom of a collar placed on the horse's neck. Or if the rope is long enough, loop the middle to the collar; buckle a strap securely to each hind pastern, pass the ends of the rope through the rings, and back through the collar. One man manages the head to bring the horse down properly and easily, while assistants pull forcibly on the ropes ahead. A horse should never be cast except upon a thick, soft bed of straw or tan bark. If it is simply wished to hopple the horse, fasten the ends of the rope to the collar, and of such a length that the horse cannot kick.

Slings.—These are an apparatus to suspend a horse's weight in case of fracture, rheumatism, or other diseases when the animal cannot bear full weight on the limbs. First a broad strip of leather or strong canvas two feet wide and six or seven feet long, stiffened at the ends by being sewn around smooth billets of wood. To this a breeching is attached to pass around the buttocks, and others to and about the breast, to hold it securely. Loops must be fastened to the billets at the ends of the girdle of sufficient strength to bear the weight of the animal. Double blocks and pulleys are attached to these, suspended at proper points, and thus the animal is lifted and suspended so as to bear much or little weight on his limbs.